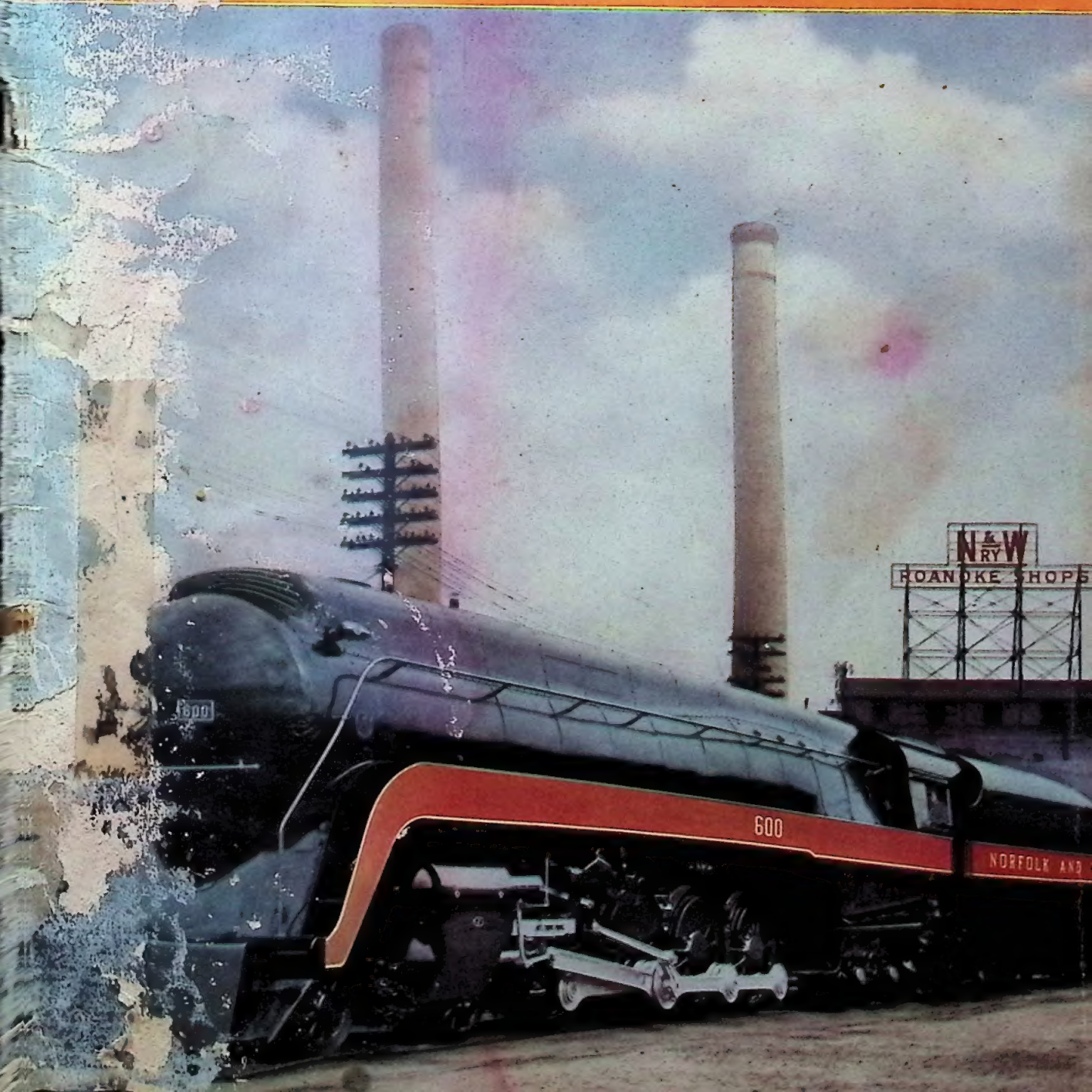
Trains

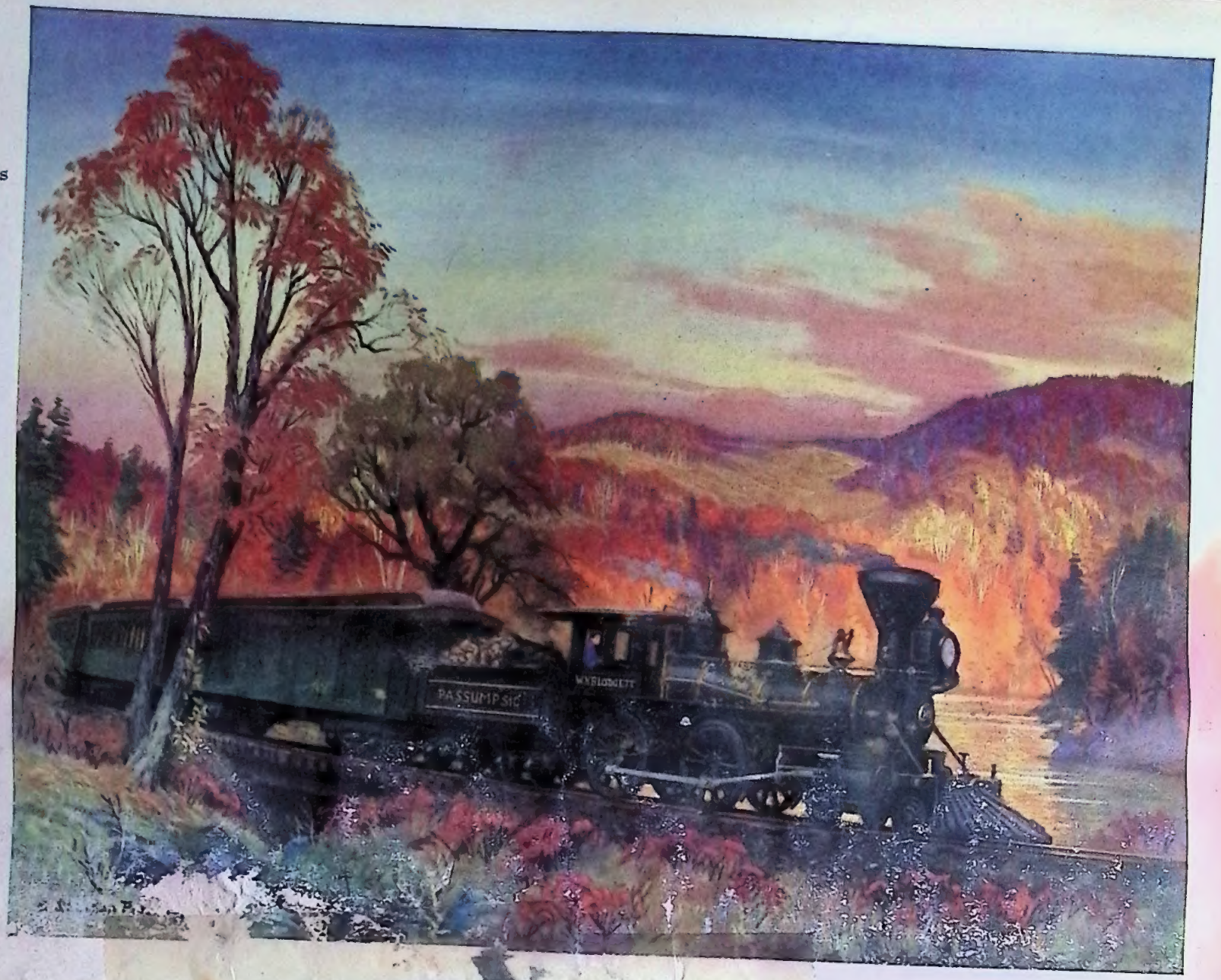
MARCH

25¢



Daniel Willard's favorite engine.

The original of this painting by A. Sheldon Pennoyer, famed railroad artist, was presented by the Baltimore Association of Commerce to Daniel Willard, chairman of the board, Baltimore & Ohio Railroad. It shows the young engineer Dan Willard running his favorite locomotive, W. K. *Blodgett*, along the Connecticut River in 1882, about three miles north of White River Junction, Vt. This was the Connecticut & Passumpsic Rivers Railroad and is now part of the Boston & Maine.



Courtesy Baltimore & Ohio Railroad.

Trains

Editors: A. C. Kalmbach, Linn H. Westcott, Willard V. Anderson

Vol. 2 March, 1942 No. 5

Features

MAIN LINE TO VICTORY ---- 4
By Victor H. White.

LIEUT. BEWLEY'S PHOTOGRAPHS ---- 8
By H. W. Pontin.

HERE'S HOW! ---- 10
Railroad safety rules explained.

RUSH—PERISHABLE ---- 12
By Jean Lee.

LAKE SHORE & MICHIGAN SOUTHERN ---- 18
Famous nineteenth century Fast Mail Line.

ONE RAIL INSTEAD OF MANY ---- 22
Welding rails cuts maintenance costs.

THE BEL-DEL ---- 26
Now part of Pennsy system.

FEATHER RIVER ROUTE ---- 28
By A. C. Kalmbach.

TRAINS' MAP OF THE UPPER SIERRA REGION ---- 36
Showing the Feather River Route.

also Letters, News, and Miscellany.

Waybills

Early in the morning of February 9 our country changed to war time. This was a major operation for the railroads. Most roads stopped all trains at 2 a. m. while crews reset watches and compared them. At the next station crews checked with the dispatcher to make sure they were correctly geared to the new time. Trains starting before 2 a. m. finished their runs an hour late.

I was on a westbound New York-Chicago train when all this happened, and it saved me two settings of my watch. I was spared the usual adjustment to Central time, as well as the change to war time. It all happened at once, much to the amazement of some of the passengers. Next morning a man in the Pullman washroom emerged from his lather and asked the porter, "Are we on time?"

"Well, suh," said the porter, "we is not only on time, but we is 60 minutes ahead of time, except of course that we is an hour late!"

The subscription blank included with this issue is for your convenience in ordering TRAINS by the year. If you are already a subscriber, won't you please give the blank to a friend, with the recommendation that he subscribe?

With paper shortages already apparent, the government may ask a cut in return privileges to news dealers, but direct mail subscribers will get their magazines regularly and on time. If you prefer buying from a news dealer, please buy from the same dealer each month and ask him definitely to reserve your copies; otherwise you might miss an issue.

Most railroad passengers get up from their seats three or four minutes ahead of the station at which they will get off and then stand in the aisle waiting, waiting, waiting. I prefer to sit comfortably until the train is actually in the station and the line of passengers is moving to the door. Now am I smart, or just lazy?

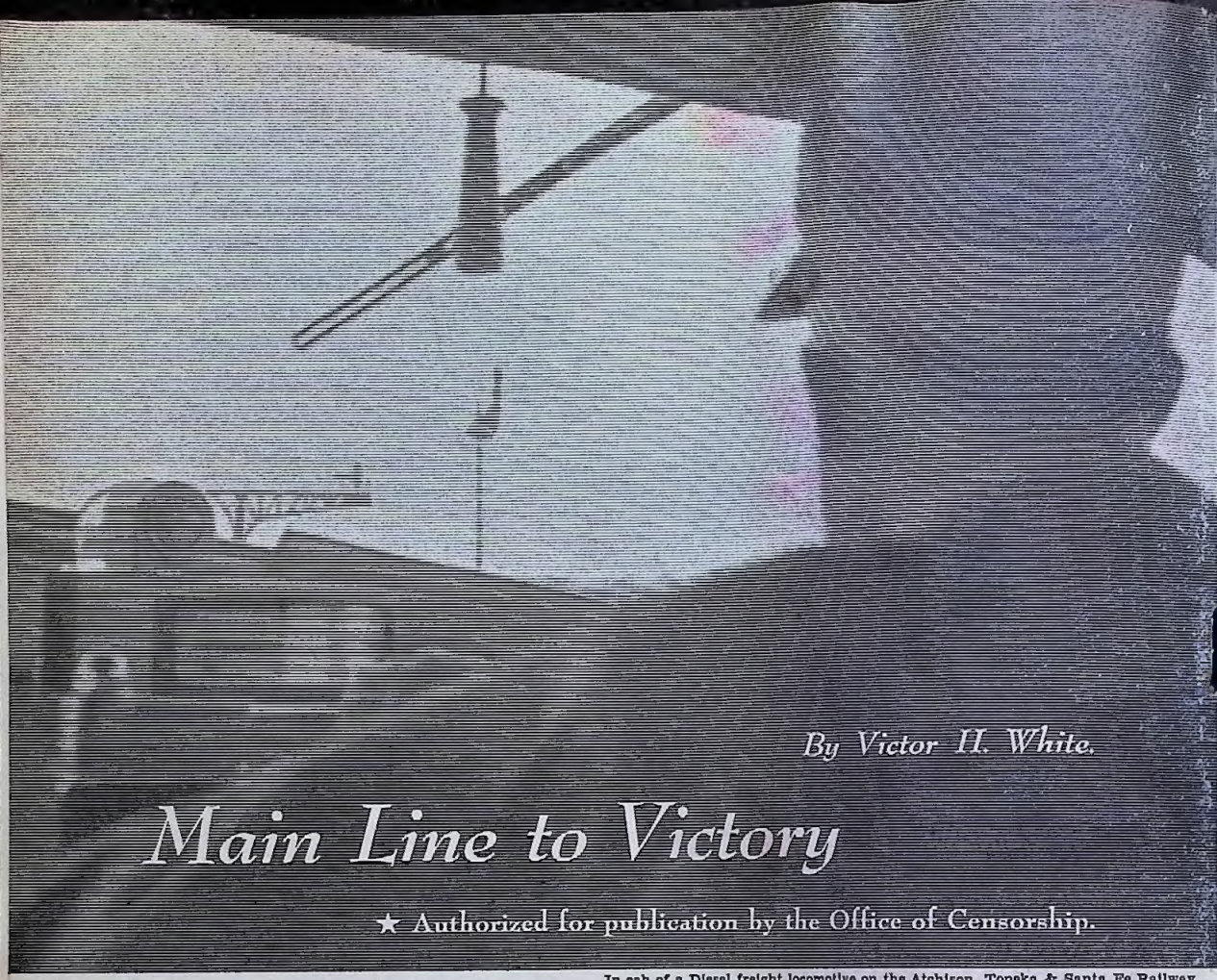
A. C. K.

Published monthly by Kalmbach Publishing Co., 1568 W. Pierce St., Milwaukee, Wis., U. S. A. The title TRAINS is registered as a trade mark in the United States Patent Office.

Entered as second-class matter Oct. 11, 1940, at the post office at Milwaukee, Wis., under the Act of Mar. 3, 1879.

Subscription Rates: Per year in U. S., Central and South America, $2.50 Single copies 25 cents. In other countries, $3.00 per year; single copies 30 cents.

The first issue of TRAINS was for November, 1940. Most back copies available at 25 cents each.



By Victor H. White.

Main Line to Victory

★ Authorized for publication by the Office of Censorship.

In cab of a Diesel freight locomotive on the Atchison, Topeka & Santa Fe Railway.

WAR! Japanese attack Pearl Harbor! Seize Thailand! Invade Malaya! American army flier sinks Japanese battleship *Haruna*! Japanese land in Philippines! Churchill arrives in Washington, confers with Roosevelt!

These are recent headlines. History and heroes are being made and our people are saying, "America was unprepared for this treachery, but when she gets rolling . . ."

Our citizens were talking like this that last week in 1941 when the Japanese were landing in increasing numbers preparatory to the attack on Manila. They are even now saying fearfully, "If we can hold Singapore, if we can get help to the Dutch East Indies, to Australia, soon enough . . ."

Our own citizens do not realize how America is already rolling, rolling as she has never rolled before.

There are no headlines: Transports loading at San Francisco! Cruisers and destroyers wait today in the shadow of the great Bay Bridge, gone tomorrow, convoying men, guns, tanks, a complete and fully mechanized army already in motion across the broad Pacific before we ourselves seem to realize it can be done.

And how is it being done?

The American railroads were ready for this emergency.

On the evening of December 28 I stood on the rainswept steps of a passenger station in a division town of 45,000 population and talked with a man who had charge of engine maintenance for Union Pacific. He was strongly built, a clear-eyed fellow of perhaps 45. He had just come off duty and he smiled when I asked, "How've you been able to do it?"

"Do what?" he grinned evasively.

"Put so many trains through to the Coast," I said bluntly.

"Have there been quite a few?" He smiled

and would say nothing more on this secretive subject except, "Every one of us railroad men feels he's in this war as much as the boys in uniform. All we can do to help those boys through with proper equipment won't be half enough."

"You'll never get the credit you'll deserve," I suggested. "If we do save Singapore and Australia or even keep submarines or worse away from our West Coast, it'll be the railroads that made it possible. It wouldn't be easy to make the people realize that." I went on to bet him that no other nation could move half as many men and as much equipment half the distance in twice the time.

He said, "To hell with any credit for it. A soldier's business is fighting. My business is moving trains. Whatever your business is you do it the best you can. And that's all there is to it." Then he walked off in the rain.

This is being penciled on scratch paper in a San Francisco hotel at the very scene of greatest possible action on December 31, 1941. By the time it reaches print what is happening will no longer be a military secret. General MacArthur is fighting desperately in the Philippines; Singapore is menaced, the Dutch East Indies lie in the path of conquest. What is being done by the railroads at this moment might not be recorded if I failed to do it now.

Heroes are struggling in rain and sleet and snow this New Year's Eve in America as well as in the heat of Malaya and in the Philippines, on every mile of Southern Pacific, Santa Fe, Union Pacific and Western Pacific that feed directly into San Francisco. They are laboring along every other mile of railroad in the country also. A soldier, with full war kit and fixed bayonet, stands lonely vigil night and day at every tunnel, at every bridge head. The wind shrieks around him. Ice and snow drive against him. There is no excitement for him, little glory. In many a location it is a real hero's job.

And trains move.

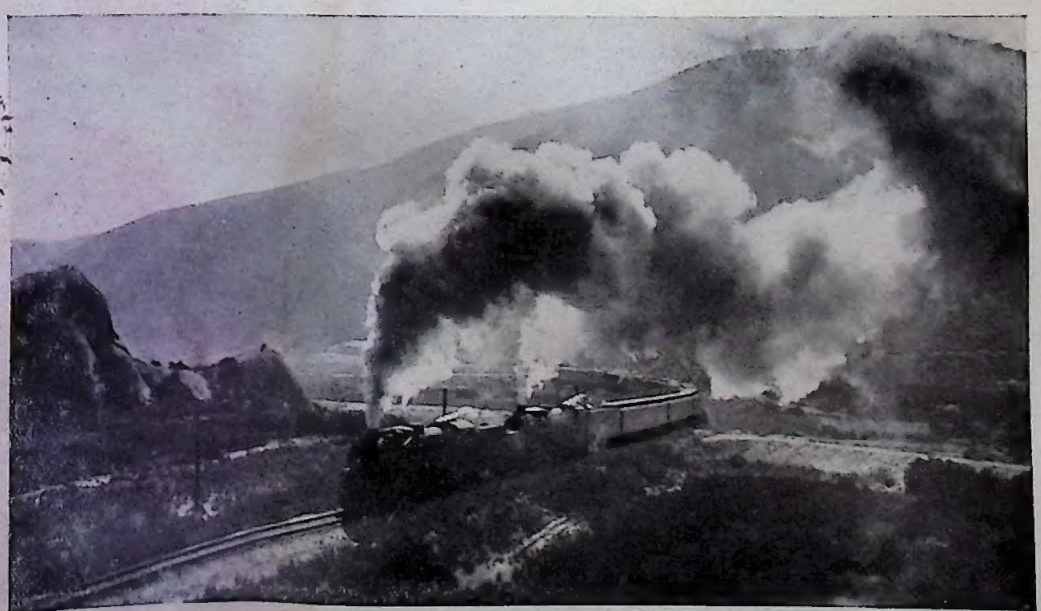
How they move!

Let us take the short stretch of track down Cajon Pass between Barstow and San Bernardino, Calif. This is used jointly by Union Pacific and Santa Fe. Here is 81 miles of vital double track that is normally one of the busiest stretches of hazardous mountain railroad in the western United States. Westbound the track dips toward the coast at as much as a four per cent grade.

My information is off the record, entirely

The railroads on the job.

Now, in wartime, we can best realize the vital part railroads play in our national economy. Railroads are the only fully reliable all-weather means of transport, and move goods in quantity at the lowest over all cost. The average charge per railroad ton-mile is only half the average truck charge.



Ed Hoffeld, 2332 Mansfield Ave., Los Angeles, Calif.

H. Eichstaedt, 202 Monroe Pl., Monrovia, Calif.

Operator at Cajon Summit.

Harvey Johnson, operator at Summit station on Cajon Pass, hasn't time to talk with visitors these days. He and the men on the other two tricks have reported as many as 150 trains past Summit in 24 hours, as many as 22 troop trains in a day.

unofficial. There have been no war department official communiques and never will be. But the railroads brought as many as 22 troop trains in one day down that treacherous mountain grade. And this in addition to handling regular freight and passenger service efficiently.

A train of 18 cars (overweight in any railroad man's language) sparked and squealed into San Bernardino braked by only one monstrous freight engine. (I had no time to check type and numbers.) The car wheels had literally been burning up. Fourteen red-hot brake shoes were replaced and the train moved on. One car came in with four-inch flat spots on its wheels, was jerked onto a side track in no time at all, and the troops rolled on.

These trains carried cars from every line in the country: New York Central, Illinois Central, Texas & Pacific, Santa Fe, Union Pacific. There were a few wooden coaches. There were hundreds of Pullmans. And there were cars still lighted with oil. All of these and more might finally be coupled behind an SP engine that had recently helped boost the *Noon Daylight* over the Coast Range, perhaps within sight of Japanese submarines in the Pacific beyond the Coast Line tracks.

Trains moved. How they moved!

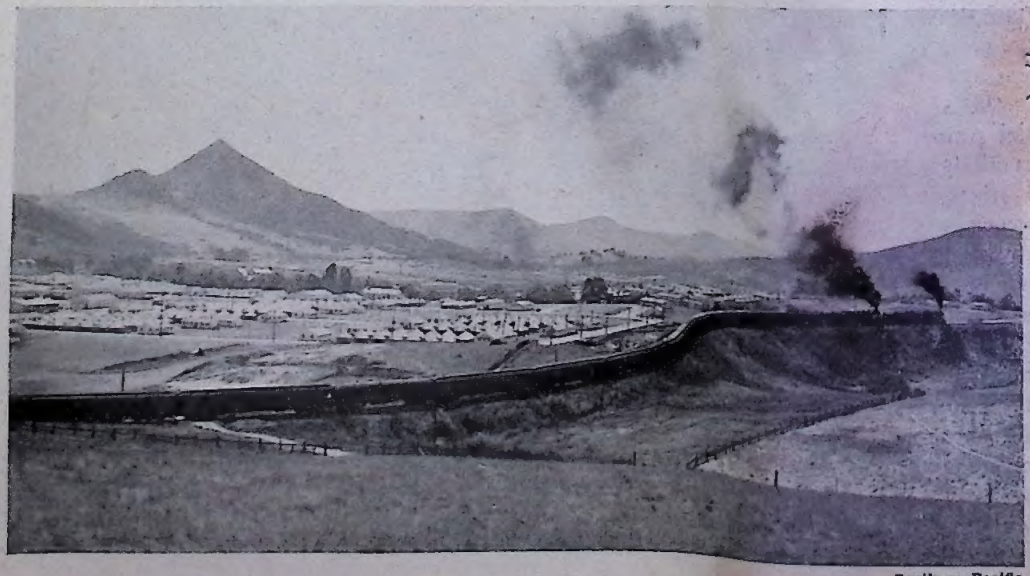
I asked a ticket agent I know how the dispatchers were holding out on his division. "They're going crazy," he admitted. "We carried Jim ———— out night before last. He collapsed at his desk; nervous strain too great."

"Any wrecks?" I asked. "Confidentially, of course?"

He grinned. "Pig-headed hog's head deadheaded into a side-tracked freight engine in the yards at Les ————; nothing serious."

Nowhere could I find record of an accident, not the loss of one life, nor even an injury.

From the windows of the morning *Daylight,* a streamliner which cost a million dollars and makes the 470 miles from San Francisco to Los Angeles in 9½ hours, I saw special crews combatting a rainstorm that had



Southern Pacific.

loosened the treacherous clay cliffs. In places the tracks had been nearly washed out but had been repaired hastily but securely. On another stretch a slide had been cleared almost in a matter of minutes. Everywhere men were deepening ditches to carry off flood waters. They were digging small relief trenches to stop any possible trickle of water starting across the right of way between the ties. They were not trusting to any luck in keeping this vital defense unit entirely open 24 hours of every vital day.

The *Daylight* carries a special passenger agent who makes announcements from time to time through this ultra-modern train's public address system. His words are broadcast from both ends of each car, as are also appropriate radio programs.

As we left San Francisco he informed us frankly that the train would likely arrive somewhat late in Los Angeles. "Our government's needs at this time," he said, "must come first. Some of our trains are temporarily canceled. Traffic is exceedingly heavy. This condition necessarily makes some delay unavoidable."

The train's reserved seats were practically all filled. It carried extra coaches. But it arrived in Los Angeles only an hour and 15 minutes late. Our return train five days later was a half hour late in San Francisco. Three days later, with better weather and the greatest rush of troop movements already behind them, trains were on time again. But from sunset to sunrise all trains on the West Coast run with drawn blinds and blue vestibule lights, entirely blacked out.

The SP canceled some passenger trains to relieve congestion. It likely canceled some because it needed the engines. I believe every engine that could efficiently pull or push or boost or shove was pressed into active service.

I don't pretend to know where our navy is. But perhaps by the time this is printed it will be no secret that where steel rails ended at tidewater, great ships took over, transports, convoys, warships, disappearing seaward in the red glow of Winter sunset westward beyond the Golden Gate bound for a great adventure.

It will go on and on. A continuously increasing flow of men and guns and tanks and planes. Already the flood backs up inland. At division points, in public parks, sheltered beneath innocent-appearing groves of shade trees, our reserves pile up in ever-increasing readiness for the journey over the sea. Supplies to Australia, to the Dutch East Indies, to Malaya, and to our great new base in Eritrea. Also to Russia, to Britain, to North Africa, to Singapore.

The click of steel rails that every railfan loves so well becomes suddenly the very pulse beat of a nation's life blood: men, guns, supplies. America rolling, rolling, rolling.

It is secret work now. Our quick efficiency must strike the enemy with the sudden force of complete surprise. But when it has soon become an old story, every railroad man, every American, must feel a little thrill of pride in the quiet, efficient, business-like way it was done.

I can think of no better conclusion than to quote from a notice recently displayed in many of the railroad passenger stations throughout the country:

"IN ALL THE WORLD NO JOB IS BEING BETTER DONE TODAY THAN BY THE AMERICAN RAILROADS."—Hon. Clarence F. Lea, Chairman of Committee on Interstate and Foreign Commerce. House of Representatives.

Southern Pacific.

Lieut. Bewley's Photographs

By H. W. Pontin of the Railroad Photographic Club.

AMONG the courageous defenders of the Philippines, fate and present location unknown, is one of the country's better railroad photographers, Lieut. Edward N. Bewley, Far Western representative of the Railroad Photographic Club.

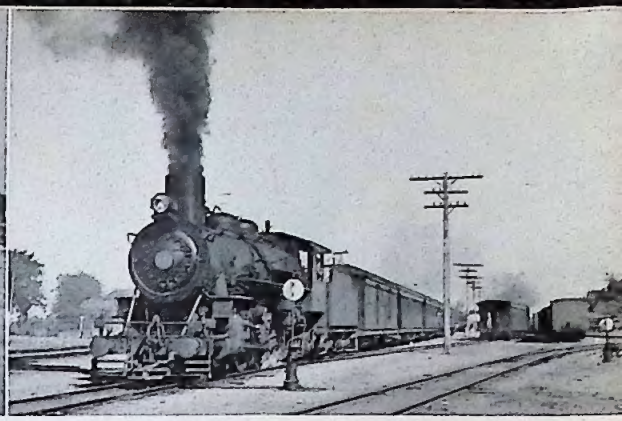
The photographs of Lieut. Bewley (two more are included with the Western Pacific article in this issue of TRAINS) are all the more an accomplishment if one considers that, without exception, they were made with an ancient Kodak with top shutter speed of 1/100 second. The lieutenant tried many new types, but refused to be parted from his old faithful.

Bewley was deeply immersed in the study of railroading while a student at Stanford University, and his specialty was historic lore of Western lines. Much data credited to him is now on file in the university library. He was at the same time interested in aviation, and it was in the army air service that he won his wings with the rank of lieutenant. Duty routine took him to many points in the West and Southwest, and always the old Kodak went along to record examples of train action.

His outstanding feats were what he termed "running studies" of Santa Fe and Southern Pacific trains battling California mountain grades. He explored Cajon Pass [October 1941 TRAINS] from one end to the other, plotting the locations for many fine studies featuring trains like the *Chief*, usually double-headed for the grand performance. He would run ahead of the train time and time again, usually calling for some tall driving along the highway. How he managed to steer an automobile and change roll films at the same time will always remain a mystery. But do it he did, producing the only consecu-

Broadside view of the *Chief's* engine at speed.

Would you try this nearly broadside view of a locomotive at speed, and with only 1/100 maximum shutter speed? It is the lead engine on the *Chief*, doubleheading up Cajon Pass with a 2-10-2 and a 4-8-4. The 3928 is the helper, and the 4-8-4, No. 3770, will take the train through to La Junta, Colo. Santa Fe locomotives are chiefly characterized by their bigness, as the lines emphasize the size.



Typical Pacific Coast shot and one from Manila.

The Southern Pacific *Daylight* speeds southward through Mayfield, Calif., at about 65 miles an hour. The loco, No. 4410, is the first of the original six *Daylight* engines.

The huge smoke stack belongs to No. 147 of the Manila Railroad, pulling a European style passenger train at Dau station in the Philippines.

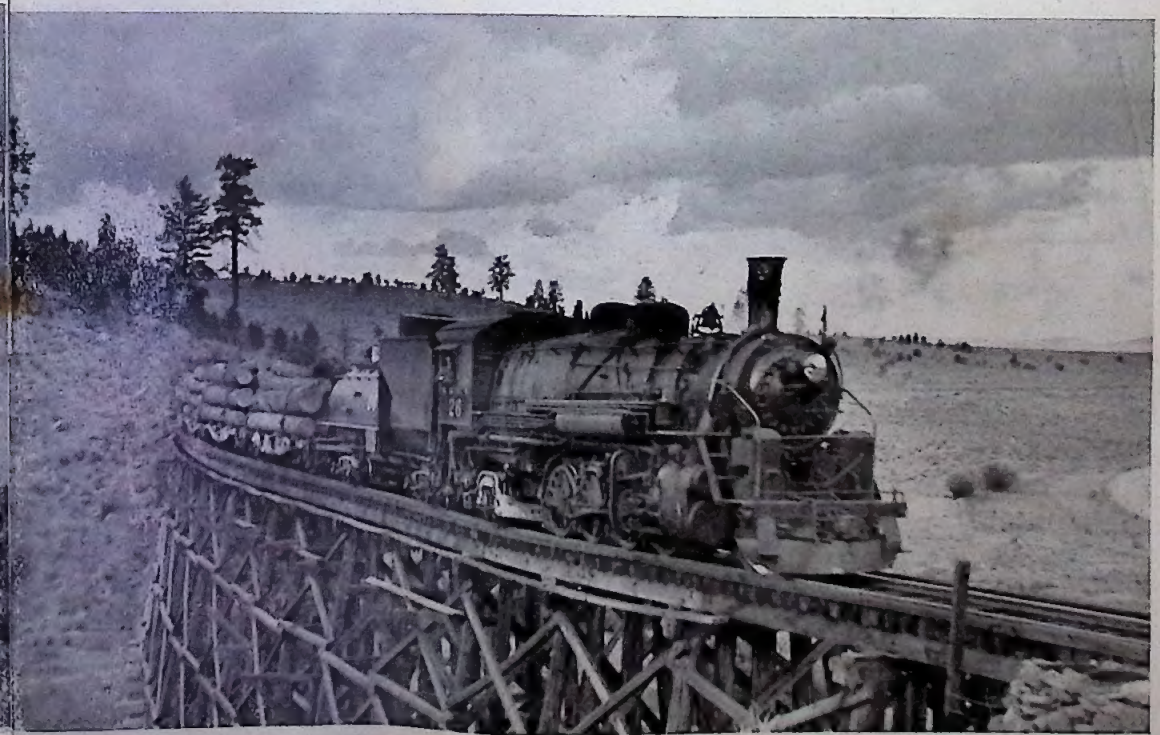
tive speed record of the *Chief* from bottom to top of Cajon—42 exposures of the one climb! San Gorgonio Pass on the Southern Pacific was also treated in this manner, the train a heavy fast freight sporting four locomotives.

In New Mexico a year or so ago Bewley had the opportunity to explore the possibilities of aerial train photography. His negatives, taken from heights of 3000 feet or more, show a wealth of detail, with passenger or freight trains spidering across the countryside.

Last word from the lieutenant was a letter mailed in November from the Philippine Islands. Enclosed were negatives of Manila Railroad motive power and trains, one of which is reproduced here.

Log train on the Oregon & Northwestern.

This dainty looking Mikado with the big spark catcher is Oregon & Northwestern No. 26, in action up a heavy grade at Burns, Ore. The road is controlled by the Edward Hines Lumber Co., a large Chicago concern with mills at Hines, Ore. It connects with the Union Pacific at Burns and operates a daily freight service between Hines and Seneca. Track mileage is 51. Burns is in east-central Oregon.

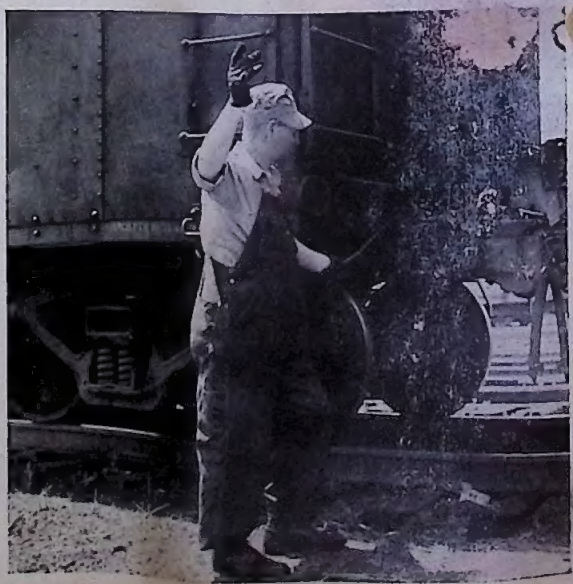


Here's How!

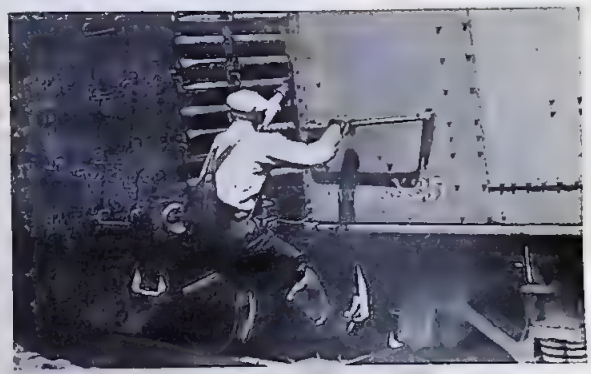
★ Safety doesn't just happen.

THERE'S a safe way and a wrong way of walking and climbing around railroad equipment and property. The New Haven Railroad uses these photos, taken in its Back Bay Yards at Boston, to instruct employees; and they may well be taken to heart by rail-fans, who after the war will again be free to roam about many a railroad property. Leaving war out of the picture, the principal reason railroad police chase outsiders off the property is possibility of accident. Railroading is a fascinating business, but it's dangerous to be around trains without knowing the rules. If outsiders show that they know the safety rules and use them, railroad police show greater leniency. Even such an innocuous thing as walking across tracks without stepping on top of the rails may mean the difference between getting bounced and not getting bounced.

Getting out of an engine cab seems simple, but there is definitely a right and a wrong way to do it, as shown above. The right way is to get down backwards, right, the same way one climbs up. But to an amateur it seems much more natural just to walk out of the gangway door and down the steps frontwards. Adjusting a drawbar with the foot, (left, below) has resulted in many a crushed foot. The engineer should be signaled to move ahead.



Stepping on rail heads, as in the left photo, invites a bad slip and a fall, perhaps just at the wrong place and time. It's easy to step over the rails instead of on them. The railroad employee sizes up anyone who steps on rail heads as an outsider. Yard brakemen have an exceedingly dangerous job, but the railroads have cut accidents by showing wrong (left, below) and right ways of even such elementary things as riding the side of a freight car.



Cars in a railroad yard may move at any time, and when kicked by an engine they may move quite suddenly. So crossing close to the end of a car is decidedly unsafe. Best way is to stay well in the clear with a weather eye peeled for any movement. Wrong way of throwing a switch invites a rather personal rear end collision (below, left).

Courtesy New Haven RR.

Rush — Perishable

★ From every part of the United States fruits and vegetables are hurried to your table by train.

By Jean Lee.

Illustrations by Russell W. Lee of the Farm Security Administration.

"YES, I'll take a box of Louisiana strawberries, and a stalk of celery—I want Colorado celery please, and some Idaho potatoes for baking, and some of the large California oranges. You'd better give me a dozen small Florida oranges, too; I like them for juice. And spinach—that's the Texas spinach just in, isn't it? And a bunch of brocolli and two of carrots. They are from Texas too, aren't they? They do seem best this time of year. *Oh,* and fresh mushrooms—where are they from, New Jersey?" I was giving my grocery order one blustery afternoon in March, in Chicago.

And suddenly, as I stood there in the neighborhood store glibly demanding fruits and vegetables from every corner of the United States, I was shocked at myself.

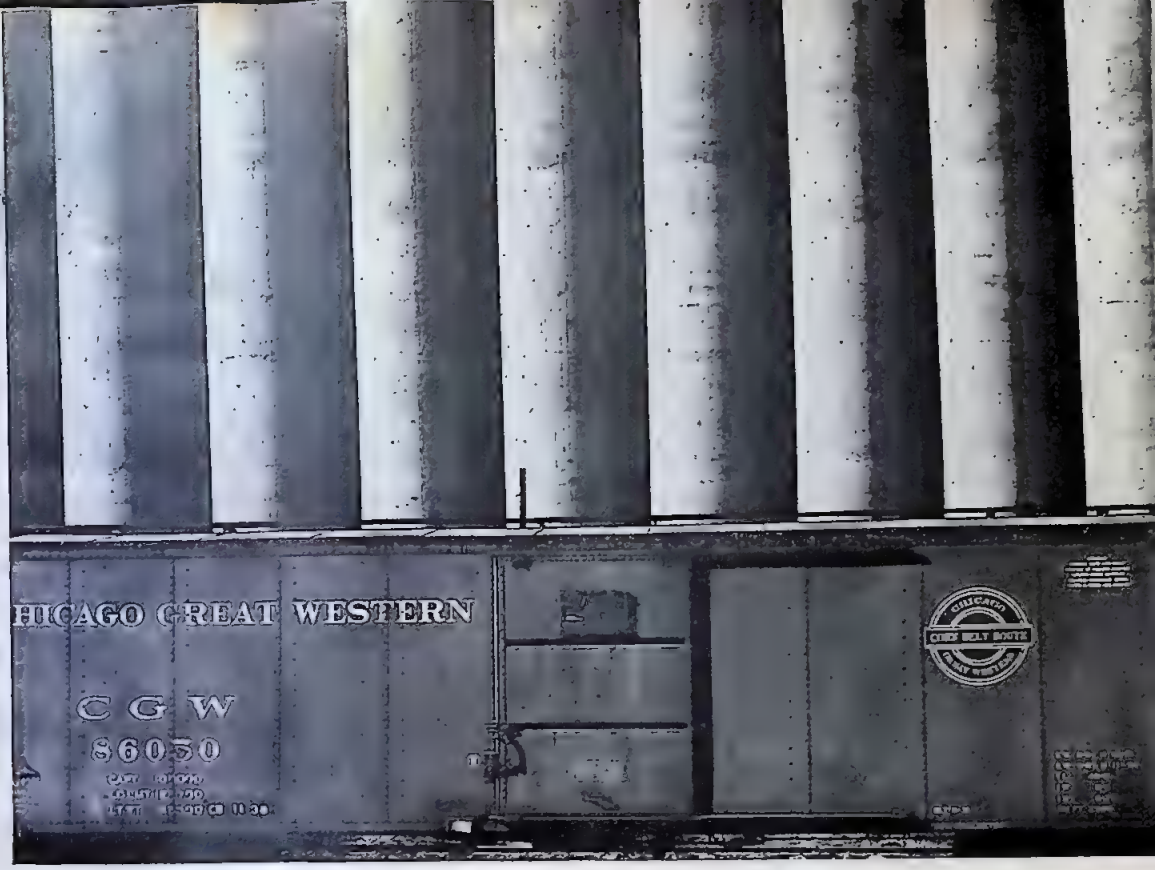
Who was I? Was I some ruler of vast domains sending my couriers to the farthermost reaches of my country to bring back delicacies for my table?

No, not a king was I; just a housewife who was, as were thousands of others, standing in a grocery store on this Wednesday afternoon and with the few dollars in my purse buying fruits and vegetables still fresh from the fields for my family's supper. Nothing was too good for me, because I was a housewife living in the United States, where I could demand and get the best.

As I walked home still musing on my purchases from far places, the old nursery rime came to my mind—"All the king's horses and all the king's men"—but I made up my own version of the ending: "couldn't bring me what the railroads have delivered for my supper table tonight."

When I arrived home, just for curiosity's sake, I looked over some of my grocery supplies to

Loading spinach at La Pryor, Tex.



Freight car against backdrop of grain elevator, Omaha.

see where they all did come from. There was flour milled in Minnesota and another sack from Washington; two kinds of rice, one from Louisiana and a wild variety from Minnesota; tomatoes from Maryland and shrimp from Mississippi; beans from Utah, asparagus from Idaho and salmon from Oregon; dates from California and grapefruit from Florida.

In my mind I saw the strings of refrigerated freight cars moving into Chicago laden with all these foods, and I saw them in interminable lines going into all the large cities and the small towns and the villages. And again I was shocked at my complacency—I hadn't realized how much I had taken for granted, how little I had thought of the tremendous problem of getting all these things from the fields of the nation to the shelves of my grocery store. I shook my head in bewilderment. It seemed a hopeless maze to me, but enough of that sort of worry; transportation was a problem for railroad men and they seemed to be getting along quite well without my worrying over their problems.

Several weeks after that afternoon in Chicago I started on a trip with my husband. We traveled some 50,000 miles, staying mostly in the rural sections, and I saw, first-hand, dozens and dozens of different products which are raised in the country. I saw them in the fields, I saw the harvest and the packing sheds, and I saw the refrigerated express cars and box cars being loaded and hastening on their way to the markets.

No time of the year is so exciting and stimulating to me as harvest time, no matter whether the harvest is of strawberries or cotton or wheat or corn or hops or apples. I like the feel of the country which has droused through the heat and lushness of Summer and then bursts into ripeness and maturity; I like to see the cotton in the gin yards and the crates of fruits and vegetables pouring through the packing sheds into the waiting freight cars. Not for me the timid awakening femininity of Spring—nor do I think at harvest time of Mother Nature. No, it's a virile, bustling masculine time—Papa Earth feeding his brood.

I remember driving into Hammond, La.,

one night in the last week of March. As we crossed the railroad tracks I saw the lines of refrigerator cars, and as we drove into the center of town we heard the raucous voice of the auctioneer. The strawberry harvest was at its height. Each morning we went early to the strawberry fields and saw the negroes—men, women and children—down on their hands and knees picking the ripe berries. As soon as they were picked they were rushed to the packing sheds, always on the farm on which they are raised. By noon all the ripe berries had been picked for the day and the negroes went back to their cabins to eat and sleep, to sing and play "coon can."

The farmers finished their packing and rushed the berries into town, where they were loaded into the refrigerator express cars and were on their way to market by midnight.

I remember one night while we were there that because of difficulties between two marketing associations there was no auction. The whole town lay dead; people gathered on the street corners discussing the situation and the word went around as a worried undertone that the cars weren't moving that night. But the next night the auctioneer's voice once more dominated, and through the town went the exultant words, "The cars are moving again."

The cars were moving, taking the strawberries to places where there was still Winter; the cars were moving with strawberries, which constitute the largest single express shipment in the United States; the cars were moving, highballing it through, taking precedent over all other transportation except the crack passenger trains. And in New York and Chicago and Portland, fresh strawberries were on the breakfast tables.

Another time, in February, we were in the lower Rio Grande Valley in Texas. Carrots and brocolli as well as the citrus fruits were being harvested. A good part of the harvest laborers in this section are Mexicans, and the women and children, with their shapeless garments and big stiff bonnets, look strangely oriental as they work in the fields. In the long, cool packing sheds, Mexican boys and girls work sorting, grading, operating the washing machines and packing the vegetables into crates. On belt conveyors the crates go to the loading platform where they are packed into the pre-cooled cars; they are then sent on their way to market, where they arrive fresh and crisp and cold.

In Crystal City, Tex., where a grateful populace has erected a life-size, full color statue of Popeye, we saw vast quantities of spinach being sent on its way in iced cars. A funny thing about spinach: Two varieties are grown, straight and curly. The growers say that there is no difference in food value or taste, but, strangely, the Chicago market demands straight spinach and the New York market uses only the curly variety. No matter what the housewife wants, she gets it.

In Washington there was a bumper crop of wheat this year. I spent a few days near Walla Walla, county seat of a rich wheat-producing county. While there I saw one farmer who was pulling his combine with a 20-mule team and I also saw huge tractor-drawn combines moving through the fields as fast as seven miles an hour, cutting a 16½-foot swath through the wheat. Some of the wheat was sacked on the combine and some was poured unsacked into trucks which drove alongside the combines. At the elevators, which were full to overflowing, lines of freight cars stood. Men were busy boarding up the open doorways of the freight cars, lining them with heavy paper, and then the bulk wheat was blown in and was soon on its way to the Portland elevators and mills.

Also this year I was in southern Idaho during the pea and lettuce harvest. Not enough migrant agricultural workers came into the section to get out the crops, so the townspeople turned to and helped. In this case, as in the case of

On the covers.

The front cover photo (courtesy *Norfolk & Western Magazine*) shows the first of the Norfolk & Western's new Class J streamlined locomotives. Five of these beauties were built in the Roanoke Shops. They have 27" x 32" cylinders and 73,300 pounds tractive effort. One has a booster for 12,500 pounds extra tractive effort. The rear cover photo is of an old banjo signal on the Reading at Rutherford, Pa.

practically all vegetables, the peas and lettuce were sent into the town packing sheds by truck as quickly as they were picked. There the peas were graded, washed and packed in tall hampers with an attractive daisy-like design of peas as the top layer. Often as quickly as five hours after they were picked they were in the refrigerated cars moving to the Eastern states.

Later in the Summer we saw the hop harvest near Yakima, Wash. To most people hops are an unknown crop; the Easterner seldom knows how they are grown or what they look like, and when asked how they are used he mumbles vaguely about beer, not realizing that there is hardly a meal he eats of which hops haven't been a part, for hops are used in the yeast which goes into bread. The hop vines make a pretty crop. They are strung on heavy cord supported on tall poles, and they look not unakin to some giant variety of grape vines. The hop itself is termed a bur and reminds me of a pale green, oblong flower whose petals are closed and lapped over one another. Men, women and children—migrant workers and local people both—picked these burs from the vines this year. After picking they were taken to the hop kilns and dried for about 18 hours. It takes four or five pounds of green hops to make a pound of dried ones. After drying they are baled similar to cotton and are ready for shipment to the plants where they become a part of yeast.

The apples and pears from Hood River Valley, Ore., are now moving to the market

Icing and loading refrigerator cars.

Loading tomatoes near Westover, Md., on the Pennsy.

places. Each piece of fruit is washed and dried and sorted and graded and packed according to size and variety and quality. In working with these varieties of fruits each individual piece must be wrapped in its own tissue paper and must be packed carefully to prevent bruising from either overcrowding or jostling around.

After seeing so much of this shipping activity I thought that nothing I could find in a grocery store would ever again surprise me, but this afternoon, as I looked at an array of fresh products before me, I exclaimed, as I once heard an old negro woman exclaim on sight of an extra-red and juicy watermelon, "Lawsy, massy me, can this be I?"

Trainloads of Louisiana strawberries flow northward in Spring.

Mutual Magazine, Pennsylvania Railroad.

Scenic Middle Division near Lewistown, Pa.

Eastward down the Juniata River Valley roll the four tracks of the Pennsylvania Railroad Middle Division main line, heading for the Susquehanna River, Harrisburg, and points east. At one end of the Middle Division is Altoona, gateway to the mountains, with its soot and smoke and heavy steam power; at the other is Harrisburg, junction point for the seaboard, with its big display of steam and electric engines. For the traveler the Middle Division offers a panorama of rolling country, broad rivers, and green hills.

Along the Pennsy

Station buildings at McVeytown, Pa.

Typical of older structures along the Pennsy are the freight and passenger stations at McVeytown, 12 miles west of Lewistown. The center two tracks along most of the Middle Division are for freight, the outer tracks for passenger trains. The track assignment varies according to the particular conditions along the railroad.

Mutual Magazine, Pennsylvania Railroad.

Lake Shore & Michigan Southern

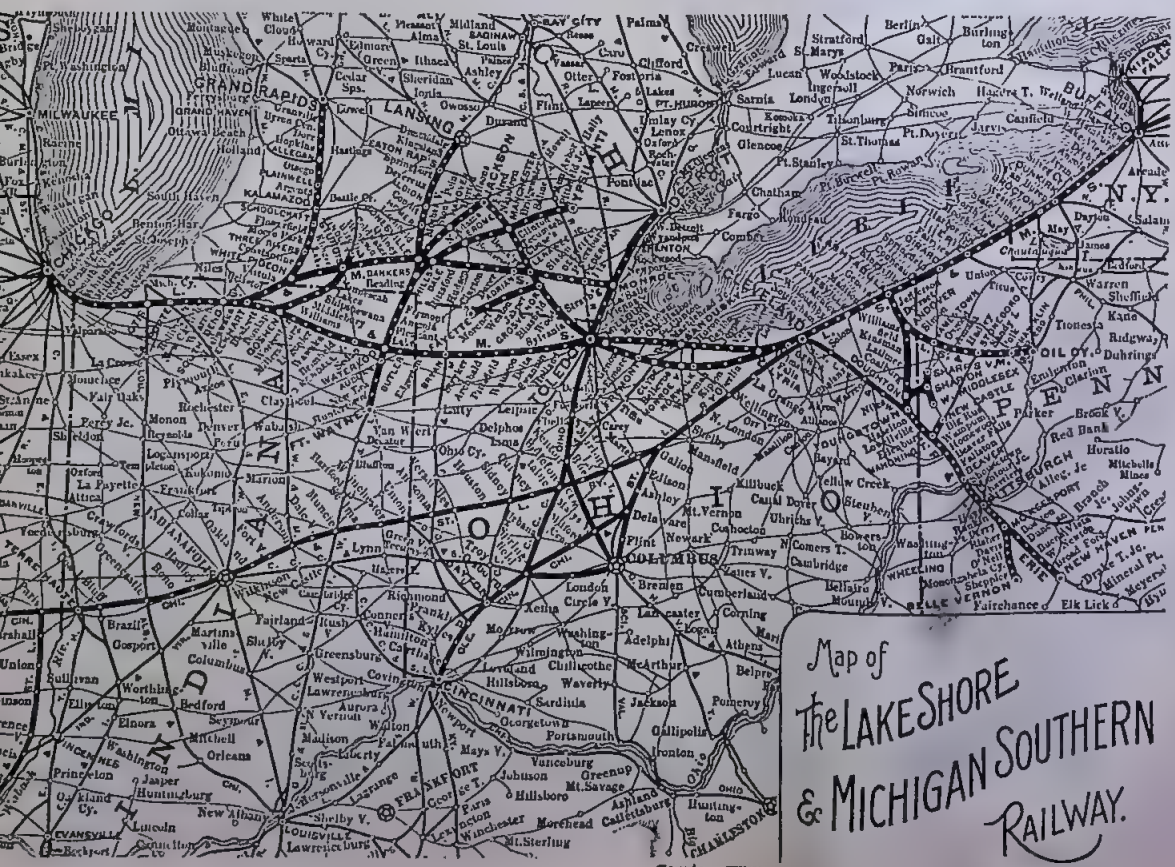
THE *Official Guide* does not list it. No schedules can be found in the public timetable racks. Even Wall Street, which remembers railroad corporations long after they have been dissolved or have been forgotten by the public, knows it only by "Lake Shore & Michigan Southern gold 3½s, due in 1997." The LS&MS ceased its separate existence in 1914, but it still lives on as a vital part of the country's second largest railroad, as the western end of the New York Central.

Back in the latter years of the last century Lake Shore & Michigan Southern was a title to conjure with. Commodore Vanderbilt took over the road in 1869, perfecting it out of the old Buffalo & State Line, the Lake Shore along the south shore of Lake Erie, and the Michigan Southern between Toledo and Chicago. When the commodore took over a railroad he didn't just acquire financial control. He took a road only if it could be made into a profitable and efficient traffic artery, and he proceeded to do things with the Lake Shore.

Favored with a good eastern connection and a naturally excellent route, the Lake Shore could set the pace. It has been said that if New York Central were completely destroyed and the engineers started out to rebuild the railroad from scratch, they could do no better than to follow in the old tie marks. The easily graded and lightly curving LS&MS fell right in line with the New York Central's

Old LS&MS timetable map.

The Lake Shore & Michigan Southern had been under New York Central control for 30 years when this timetable map was printed, but it was still the LS&MS. Chicago and New York were much farther apart then than now, and a single railroad system over that distance was not so advisable as several smaller, more easily managed properties.



Courtesy William C. Moore, 27 Norwood St., West Hartford, Conn.

★ Famous nineteenth century Fast Mail Line now a vital part of the New York Central System.

nearly gradeless Mohawk Valley and Hudson River line. The commodore lost no time in improving upon the good conditions he found. The Air Line was flung across northern Indiana from Elkhart to Toledo, shortcutting the old Michigan Southern route via Adrian, Mich. And a cutoff struck literally into Lake Erie through Sandusky.

Now the steel fleet of the Central travels along the old Lake Shore at steady speeds, and, without exceeding a comfortable 80 miles an hour, trains average 70 between major stations. The *Century* rolls along the 62-mile tangent from Butler, Ind., to Air Line Junction, near Toledo, as steady as a church.

Over the old Lake Shore the Central last October moved 632,407,335 net ton-miles, or more than a million tons over every mile of the track between Buffalo and Chicago! Over these rails were dispatched 5124 freight trains in the same month, and 1112 through passenger trains, 1204 local passenger trains, and 727 Chicago district suburban trains.

In the old days no such tonnage figures were even dreamed of, but the road moved lots of trains. Engines were light 4-4-0's and trains were short, with light cars. In the Winter of 1883-84, when Daniel Willard (later of B&O fame) held a job driving an engine out of Elkhart, the flood of grain moved east over the Lake Shore in such quantity that scheduled freight trains had to be dispatched in 20 to 25 sections. More than half of the Lake Shore traffic out of Chicago was grain. And then there were merchandise trains, passenger trains, mail trains, and live stock. The road was not block signaled, and much of it was single track.

The Great Lakes were the Lake Shore's greatest enemy. In Summer every boat that had a bottom hustled to load grain and other heavy, bulky freight. Railroad traffic ebbed. Then in Winter all the traffic came back to the rails. The little Eight-Wheelers came out in force and every man was tried to the utmost.

One of the earliest experiments in extra-fast train service was the famous *Fast Mail* of 1875, running over the LS&MS from Buffalo to Chicago. This train was painted a glistening white, with buff striping and gold ornaments. The time from New York to Chicago was slightly over 27 hours, nearly half a day faster than the passenger trains of the era. For this performance the mail bag pickup was invented, and the practice of throwing off and picking up mail without stopping dates from the original *Fast Mail*. So does the name of many a mail train on many a railroad.

The *Fast Mail* didn't last long because of an argument over payments, but it did lend prestige to the Lake Shore. Posters with a brightly colored lithograph of the white mail train picking up a bag at speed spread the fame of the *Fast Mail* route far and wide.

The next spectacular train was the *Exposition Flyer* of 1893, running from New York to the World's Fair city in 18 hours. The distance was

TRAINS collection.

About 1900.
At the turn of the century Eaton Rapids, Mich., on the Lake Shore & Michigan Southern south of Lansing, bustled about the railroad station at train time.

TRAINS collection.

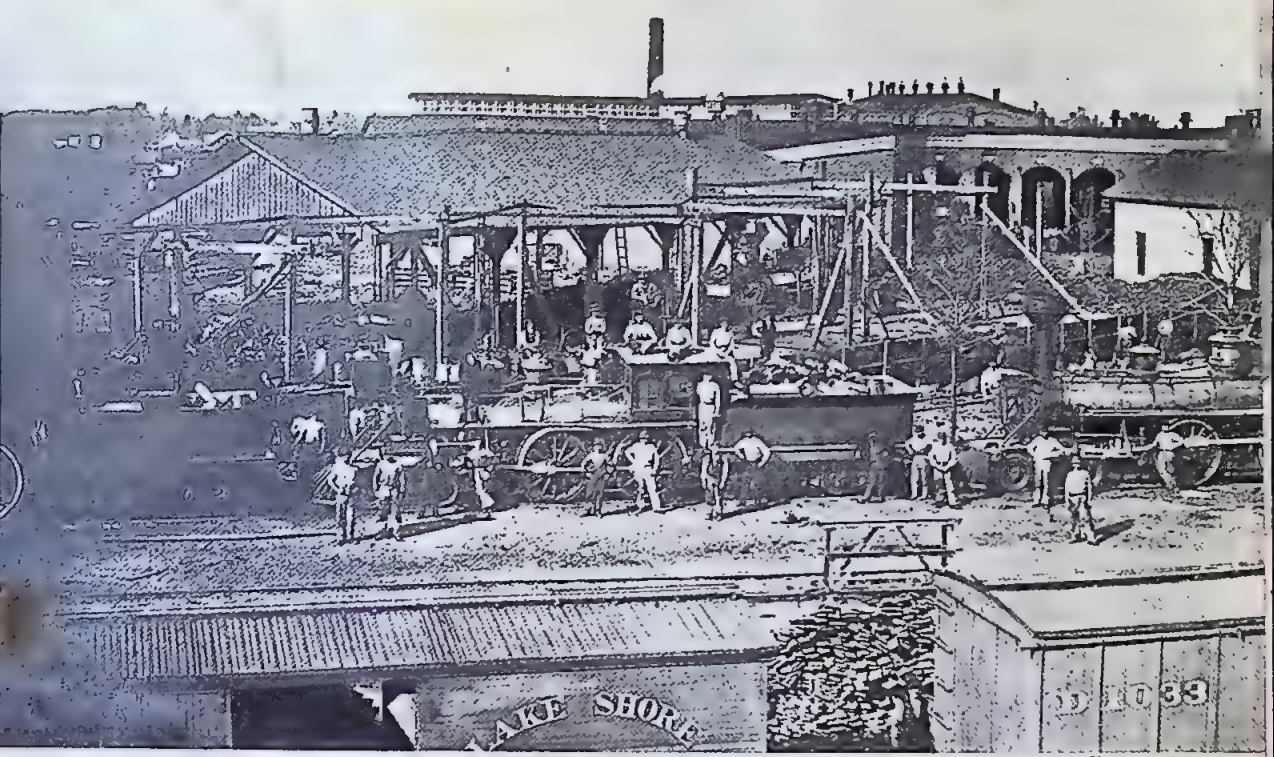
then 969 miles, and the running time for those days was most spectacular. The *Flyer* was withdrawn after the close of the fair, but it paved the way for the *Twentieth Century Limited* in 1902.

By that time the system had been quite well consolidated as far as operations were concerned. Even earlier Vanderbilt had operated his various railroads with a unity of purpose and an efficiency of management impossible among utterly unrelated companies. Come a traffic rush on the Lake Shore and whole swarms of engines might parade west from New York Central roundhouses, and the other way around if the traffic were heavy on the Central. But in the early 1900's the physical unity was carried even further. For one thing, the gauge difference had long since been dispensed with. The line between Buffalo and Toledo had at one time been 4'-9½" gauge, one inch wider than standard, but even with that difference cars were exchanged. No records indicate whether the interchanged cars ran sloppily on the wider track or whether the one inch extra was too little to affect the running. The trackage had been expanded from single to double, and even triple and quadruple. One of the major achievements of the commodore, years before, was the four-tracking of the New York

In the day of the Eight-Wheeler.

Norwalk, O., was an important division point with roundhouse and shops when these old Lake Shore & Michigan Southern photos were made back in the eighties. That was the heyday of the Eight-Wheeler. The little engines paraded across the line in Winter with section after section of the grain and livestock trains from Chicago to the East. Those were the days when grass, shrubs, and even trees could lend a rustic air to even a busy engine terminal. Now, with longer engine runs and the newer line to the north through Sandusky, Norwalk sports no shops nor roundhouse at all. The locomotives peeking from the house above are (left to right): unknown, 227, 223, ——, ——, 155, 332, ——, and ——. The general view indicates that wood was still very much in use as fuel.

TRAINS collection.



TRAINS collection.

Central. No one was allowed to forget that across New York State stretched eight parallel strips of steel, two tracks for freight and two for passenger. The same policy of ample provision for main line traffic was carried westward, and as of 1909 the LS&MS boasted 142 miles of fourth track, 244 miles of third track, out of its 1663 miles of road.

In that same year LS&MS owned 768 locomotives, 352 passenger cars, and 34,852 freight cars. An additional 125 locomotives, 24 passenger and 3994 freight cars were leased under an equipment trust plan. With this equipment the road moved nearly six billion freight ton-miles and carried nearly nine million passengers for half a billion passenger-miles.

Capital stock was 91½ per cent owned by the New York Central & Hudson River Railroad Co., and although the LS&MS was considered a part of the New York Central System it was operated as an independent organization. Rising traffic and greater integration of United States industry were spelling the doom of the old Lake Shore, however, and on December 22, 1914, it was formally consolidated with the NYC&HR. That was the end of the Lake Shore & Michigan Southern Railway Co., but not of its track, its famous trains, nor its memories and traditions.

TRAINS collection.

*One Rail Instead of Many**

★

Welding rails into long sections cuts joint maintenance and saves tearing up grade crossings for repair work.

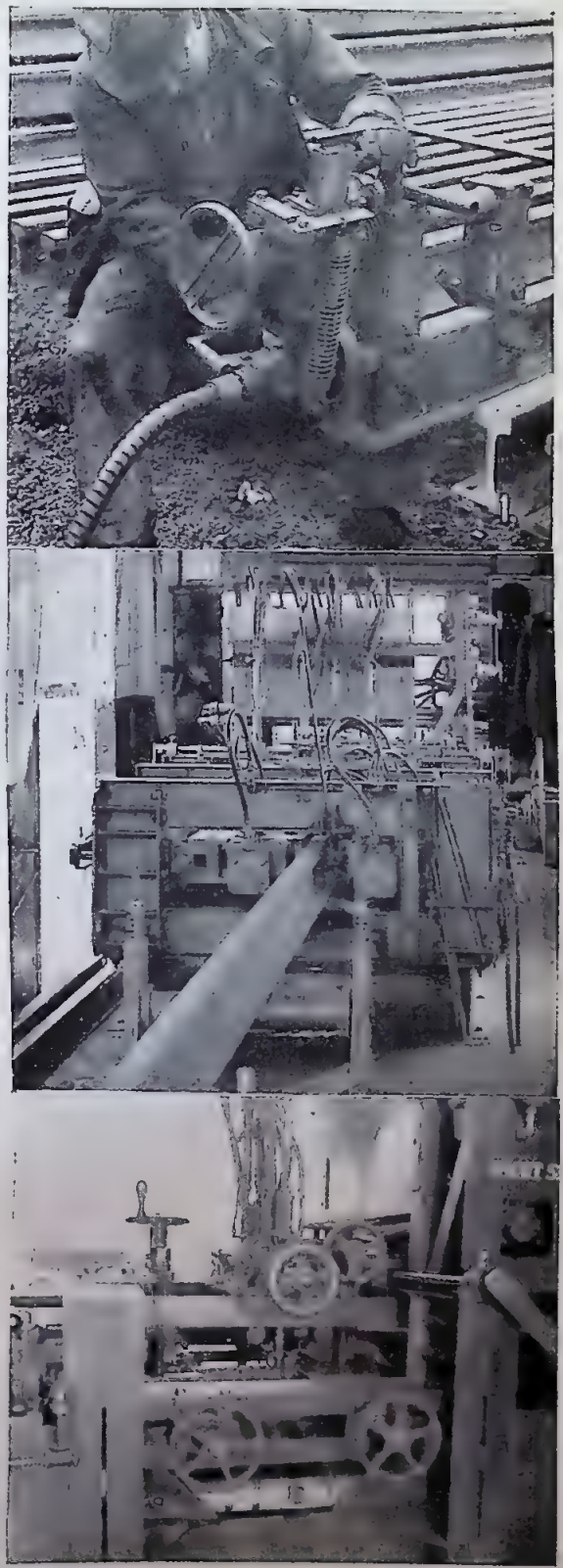
RAIL joints have always been a problem. The railroad rail is a girder, supported at intervals by ties, and the rail joint is a weak point in the girder. Worse, wheels crossing the crack batter against the rail ends, with the result that wear at this point is much faster than anywhere along the length of the rail. For years railroads have experimented with new types of joint bars, with welding methods of building up worn rail ends, and with other hoped-to-be cures for joint trouble.

Now instead of a cure comes elimination, complete elimination of the joints in favor of continuous welded rail. Years ago engineers thought the joints were necessary to allow the rail to expand and contract with changes in temperature. But the Delaware & Hudson has used many a long section of welded rail in main line track without temperature trouble. The Association of American Railroads is carefully checking the behavior of welded rail under temperature variation, and periodically measures installations on the Bessemer & Lake Erie, the Central of Georgia, and the D&H. The Denver & Rio Grande Western installed continuous lengths of welded rail in the Moffat Tunnel several years ago to meet a special maintenance problem, the corroding action of fumes and moisture on joints.

Now the Norfolk & Western has made a new departure by using welded rail to solve the grade crossing maintenance problem. With ordinary 39-foot rail lengths there is a joint or two in every grade crossing, and the paving or planking must periodically be ripped up to adjust the joint bolts or to tamp ballast, which takes an unusual beating under the joints. The N&W simply welds two rail lengths together into a 78-foot section, which

* Based upon an article in the *Norfolk & Western Magazine.*

The section of rail which an N&W crew is unloading at Bluefield station (left) is 730 feet long and was made up from standard 39-foot sections by the welding process described in the accompanying article. This unusually long piece of steel was shipped from Roanoke on a string of 17 flat cars in a regular freight train, and negotiated an 18-degree curve while leaving the material yard. Photos to the right show some of the first steps in the welding process: grinding rail ends to an absolute square, rail entering the welding machine, and the alinement of rail ends in the machine.



is long enough to bridge the crossing and leave the joints out in the open.

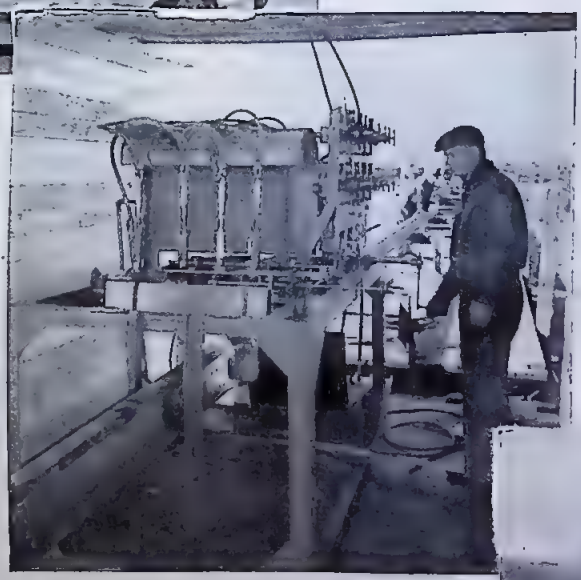
In addition to welding rail in 78-foot lengths, the railway's outfit at Roanoke Material Yard has been used for welding rail in lengths as long as 730 feet, which have been used for renewal of track in the Bluefield passenger station where the rail is embedded in pavement. Lengths up to 121 feet have been welded for the new Roanoke Yard.

The welding outfit is assembled for work in consecutive stages by utilizing a string of flat cars on which is mounted part of the equipment, with rollers to aid in moving the rail from one welding or processing station to another. In addition to the flat cars there is one steel box car (the second car from the head end) in which is housed the welding machine.

First operation in the joining of rails by welding is to grind the ends of the rails so they will be perfectly square, smooth, and free from pits and rust. This work is done with a high-speed grinding wheel and when completed the ends are greased with a special rust-resisting grease to prevent further oxidation.

Next step is to remove the grease from the rail ends by means of a chemical. Then the rails are transferred on skids to rollers and are moved by hand to the welding machine. When the two rails have been placed, end to end, in the machine, the two ends are first alined so the top of the rail is smooth and the sides form one perfectly straight edge. This alinement is made by the welding operator by turning an assortment of

As the rail is welded the pressure upsets part of the metal into a ridge which sticks out all around the joint. The bulk of this ridge is cut off by a hand oxy-acetylene torch, as demonstrated in the top photo, left. Next comes normalizing, a slow heating of the joint to equalize internal strains in the metal, and then comes an accurate grinding job to shape the rail head and base to exact dimension.



All illustrations courtesy of the *Norfolk & Western Magazine*

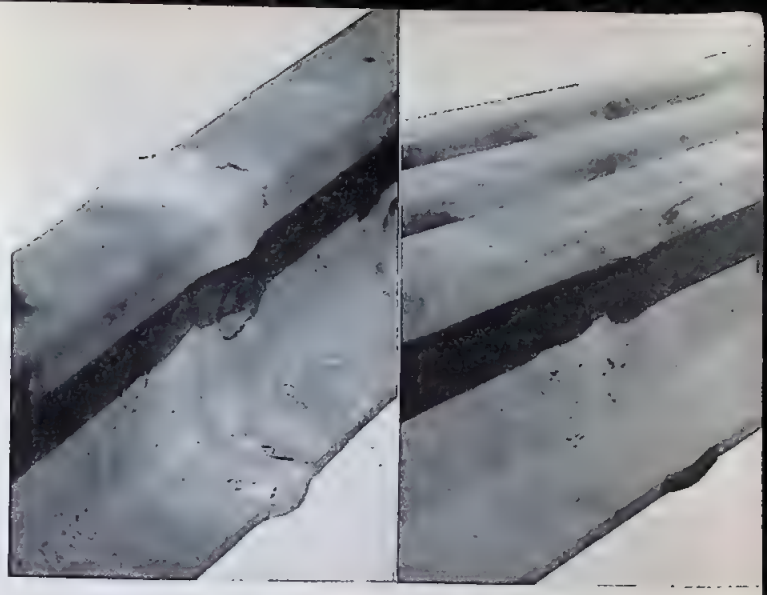
hand wheels which, in turn, move the rail ends the desired amount.

As the picture on page 23 shows, the welding machine is quite an elaborate device, with plenty of gauges, levers, hand wheels and other gadgets that completely mystify the layman. When it starts welding, the machine is more than just mysterious; it's a little frightening. For instance, when the operator lights the torches that provide the welding flame there's a sharp report which scares the daylights out of you, particularly when you're not expecting it! And then that flame is just about the hottest and brightest fire you've ever felt or looked at.

Before the torches are lit the two rail ends are gripped by hydraulic cylinders and forced together at a pressure of about 30,000 pounds. When the torches are lit, the rail ends, now in the closest contact, are enveloped by a white-hot flame which—because it contains slightly more acetylene than oxygen—is hungry for oxygen. To get sufficient oxygen to balance the combustion, the flame consumes atmospheric oxygen and thus prevents any oxidation of the metal itself while the welding is going on. The absence of oxidation insures a clean, strong weld.

The welding torches, which consist of four water-cooled heads fed by tubes connected to tanks of oxygen and acetylene gas, face the rail perpendicularly from the top, the two sides and the bottom. This arrangement permits the flame to completely envelop the rail ends. The flame is sustained by the passage of a mixture of slightly more than half acetylene gas (at about 5 pounds pressure to the square inch) and slightly less than half oxygen (at about 50 pounds pressure) through a series of small tips, arranged on the four heads somewhat like the bristles on a hair brush. The arrangement and variation in number and size of these flame tips is a very delicate one, inasmuch as these factors control the uniformity of the welding temperature.

It should be explained that the process employed by the railroad in the joining of rails is called plastic or pressure welding, a process in which the metal does not melt, pressure being applied to force the molecules of the metal together to form one solid piece of



metal. In the more common fusion process, the two pieces of metal to be welded are actually melted and joined together without pressure, with or without the addition of more molten metal from a filler rod.

After the welding flame is applied for a few minutes, the metal enters a plastic state, but never melts. Its temperature reaches a maximum of about 2200 degrees F. In the plastic condition the metal, under pressure, can flow and thus the rail ends merge into one solid piece. This movement, the maximum distance of which is seven-eighths of an inch, pushes part of the plastic metal sideways to form an "upset," causing a ridge to form around the point of weld.

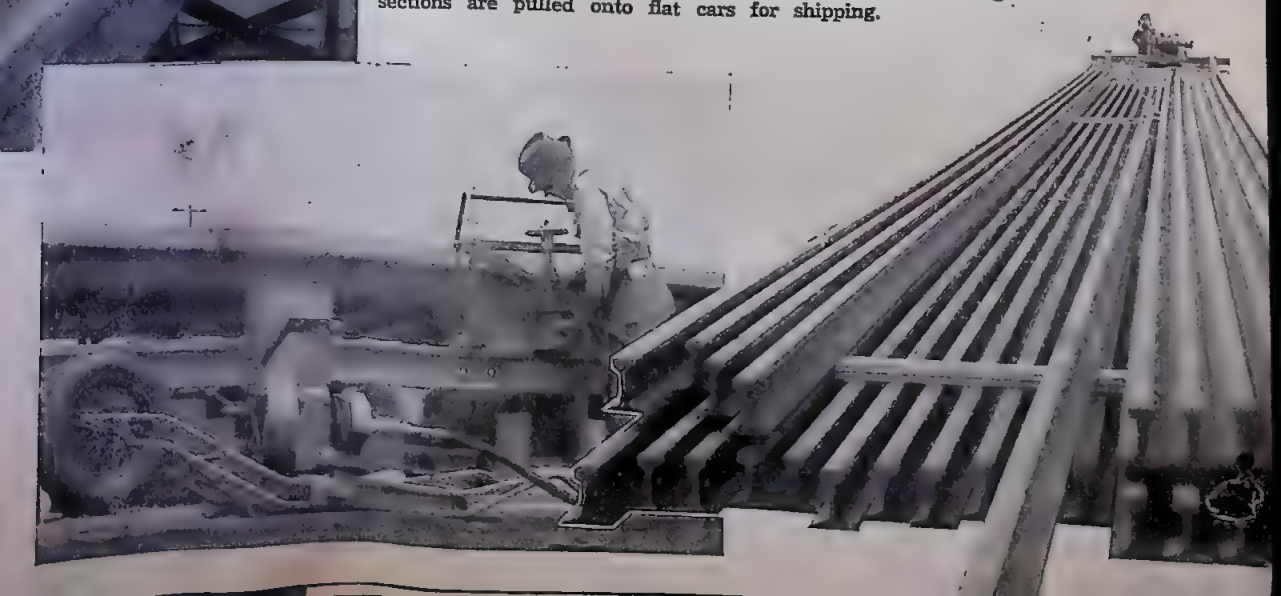
After the welding flame has been applied from 11 to 13 minutes, the torches are turned off and the welded rail is then moved out of the machine on rollers to the next station in the outfit—the cutting station. Here part of the upset metal at the point of weld is removed by means of oxy-acetylene cutting torches, used while the metal is still hot.

"Normalizing" comes next. This is the application of an oxy-acetylene flame to the welded joint until it approaches a temperature of about 1400 degrees F. The normalizing machine contains four torches, arranged to provide an even heat. The purpose of the process is to remove residual stresses and to improve the grain structure.

Then the rail is rolled to the next station, where the sides of the head and the base, at the welded joint, are ground smooth by a straight grinding wheel. After this operation the rail is moved to the final station, where the top of the rail is ground smooth by a cup-grinding wheel. This completes the process and the rail is ready for shipment.

Surface grinding finishes the job.

The last operation is to surface-grind the joint (below) so that the rail can hardly be told from a continuously rolled section. See the raw weld and the finished joint as compared in the photos at upper right. The long sections are pulled onto flat cars for shipping.



The Bel-Del

Pennsylvania RR.

Up the Delaware River from Trenton runs a branch of the Pennsylvania Railroad, 67 miles of winding, scenic single track. To the railroad rider who has traveled the Erie through the beautiful valley stretch above Port Jervis, any route along the Delaware River needs no further recommendation. A circle trip out of New York City, conveniently made during daylight hours, is over to Trenton on the Pennsylvania, up the branch line along the Delaware River to Stroudsburg, and thence back to New York on the Lackawanna over the famous cutoff with its huge fills.

As built back in the 1850's this now-Pennsy branch was an independent railroad, the Belvidere-Delaware Railroad, and it is still affectionately called the Bel-Del. The route was first proposed in 1836, and by paralleling the Delaware River and canal the promoters felt they could get the freight traffic during the Winter

★ This branch line along the Delaware River connects Pennsy at Trenton with DL&W 67 miles north.

months when the waterway was closed. How little they foresaw the all-weather efficiency and economy of rail transportation, which would someday be not a Winter substitute for the waterway, but the main means of a nation's expanding commerce!

Originally the road went to Belvidere only. This was in 1855. But by 1863 an extension was built to Manunka Chunk to connect with the Delaware & Lackawanna Railroad. Passenger traffic was light, but the Falls City *Register* of June 7, 1856, in commenting on the road, stated that "a single locomotive drawing as many as a hundred cars came down the descending grades on many occasions." Pig iron was an important commodity on the line, and, after pouring and cooling at Phillipsburg, was delivered in one day to Trenton mills, then the largest in the country. The first T rails rolled in America were manufactured at these Trenton mills in 1846. From the start this road was strongly affiliated with the Camden & Amboy, which became part of the Pennsylvania Railroad in 1871.

Only four miles north of Trenton is the crossing of the Reading's main line between New York and Philadelphia. Just north of Lambertville, 16 miles out of Trenton, is the junction with the Flemington Branch of the Pennsy, which runs 12 miles northeast into Lehigh Valley and Central of New Jersey territory. No other railroads are seen until Phillipsburg, 50 miles from Trenton. This is not only the crossing of the Lehigh Valley and Central of New Jersey main lines, just east of Allentown and Bethlehem, but the terminus of a Lackawanna branch. The railroad bridge across the river at Martins Creek, a little farther along, is Lackawanna, and then it's but a few miles to Manunka Chunk, on the old main line of the Lackawanna. From there trains run on Lackawanna rails, pass through the Delaware Water Gap, and so into Stroudsburg.

All the way the tracks are right at the river's edge. For many a mile they are on the gauntlet of land that separates river and the old Pennsylvania Canal. While the country is not as rugged as farther north, it is creased enough to be interesting, and many a bluff rises sharply from the water's edge for 300 or 400 feet. Five miles or so above Lambertville a picturesque covered highway bridge is in plain sight from the rails, and below Lambertville the traveler with sharp eyes can pick out the abandoned right of way of the one-time Trenton & Lambertville Electric Railroad on the opposite bank.

For that Saturday or Sunday off, with no tires on the car, here's a real day's outing!

Free Public Library, Trenton, N. J.

Fifty years ago on the Bel-Del.

Freight train approaching Trenton on the Belvidere & Delaware about 50 years ago. This is a superb example of action photography for the period. Notice the canal to the right. The river is out of the picture to the left. The locomotive is an American (4-4-0) type.

Feather River Route

★ Western Pacific, newest of the transcontinentals, crosses the high Sierras with only one per cent grade.

*By A. C. Kalmbach.**

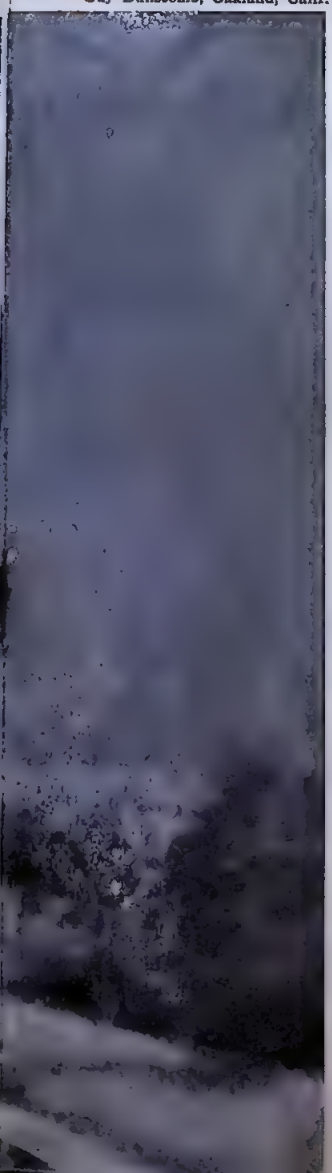
GEORGE GOULD, son of Jay Gould, worked late in his office on the fifth floor of the old Western Union Building on lower Broadway in New York. He worked hard with shirt sleeves rolled up, and he carried bulging cases of papers out to his country place over the week ends. It was 1905, and Gould was the overlord of some 15,000 miles of railroad, not just a financial manipulator but a progressive, fighting operating officer.

The Gould lines centered about the wealthy Missouri Pacific, dominating the Mississippi Valley and extending along the Arkansas River Valley to the foot of the Rockies. The connecting Wabash rolled east over the corn country and the Great Lakes Basin to Toledo

and Buffalo. The Wheeling & Lake Erie brought the system within plunging distance of Pittsburgh, originating point of as much tonnage as Chicago, New York, and Philadelphia combined. The new Wabash Pittsburgh Terminal audaciously put the Gould lines right into this traffic fortress of the Pennsylvania. The Western Maryland, with a few more miles of connecting up, would be the seaboard end of this mighty aggregation of mileage.

To the west the Denver & Rio Grande carried the Gould banner from the Missouri Pacific connection at Pueblo across the Rockies to Salt Lake City and Ogden. But here the Gould trackage ended, with no hope of friendly traffic connection, for west of Ogden was only the Southern Pacific, then united with the Union Pacific under Harriman. Even any hope of using Senator Clark's new Los Angeles & Salt Lake as a West Coast feeder was stymied when UP secured an interest in the Los Angeles road. But Gould's eyes lit on a new venture, the Western Pacific Railroad. It had been chartered in 1903 by a group of San Francisco bankers to build a competitive route across the high Sierras to Great Salt Lake but Gould soon took over.

Guy Dunscomb, Oakland, Calif.



The ukase came down that the Western Pacific must be built so well that it could efficiently compete with the solidly established Southern Pacific, the one-time Central Pacific and first of the transcontinentals. The Denver & Rio Grande, solid, substantial road safely embedded in the rich local traffic of the Colorado Rockies, took two-thirds of the capital stock and guaranteed the interest and sinking fund payments for Western Pacific. The bond trust agreement provided that the new road must have no grade steeper than one per cent compensated, no curve sharper than 10 degrees (573-foot radius) in its thousand miles or so of main line.

Little does it matter that in the panic of 1907 the Gould financial house of cards toppled under the weight of the Pittsburgh Terminal and the Western Pacific extension. The individual roads were sound. Denver & Rio Grande and its affiliate, Missouri Pacific, went right ahead. They needed a friendly West Coast connection, and they got it. The last spike was driven November 1, 1909, near Keddie, Calif., and marked the completion of the last major transcontinental railroad.

In four years the road had been built complete almost as it exists today, and engineers called it the finest railroad construction job since the West Shore. In the new picture, Southern Pacific had competition in its home territory and Denver & Rio Grande had its West Coast extension.

"Feather River Route," says the Western Pacific herald. And Feather River Route has been advertised in timetables, tourist circulars, and on the sides of box cars so well and so often that the route is almost better known than the railroad itself.

The three forks of the Feather River flow down into California's Sacramento Valley from the east and north, from sources high in the Sierra Nevada Mountains. These are the mountains that must be conquered by any railroad entering the Central Valley of the Golden State from the east; and appropriately named they are, for Sierra is Spanish for jagged or saw-tooth

Uphill freight in canyon.
Riding the rear platform through the Feather River Canyon, one sees many a sight such as this, a Baldwin-built 2-8-8-2 about to pull out of the passing siding at Virgilia to follow the eastbound *Feather River Express* up the grade to Portola. Virgilia is just a few miles below Keddie, and the freight may be bound for Ogden or north to Oregon over the Northern California extension. Scenery is typical of the canyon.

* With the assistance of the following people in gathering illustrations and data: T. B. Aldridge, W. C. Whittaker, Guy Dunscomb, and Thomas E. Brown, publicity manager of the Western Pacific Railroad with offices in San Francisco.

Western Pacific.

A welcome to the new Western Pacific.

Western Pacific was warmly welcomed to the territory it entered as first and only competitor of the well established Southern Pacific Overland Route. Above is the arrival of the first passenger train, a special, at Elko, Nev.; below, at Oakland.

Western Pacific.

mountains and Nevada means white as snow. The range is, geologically, a giant granite block some 350 miles north and south and 80 miles east to west, heaved up at an angle by some prehistoric convulsion.

Through this formidable natural barrier the Feather River (named because early explorers found pigeon feathers floating on the water) cuts a natural path from the summit to the great level valley of Central California. In its upper reaches the Feather River Valley is broad and green, in its lower portions a veritable canyon cut deep in the red and brown rock, with feathery foam rising from boiling rapids.

Before the coming of the railroad the Feather River was well known. The miners of '49 worked the canyon and the surrounding hills, and Rich Bar, a station on the Western Pacific 16 miles below Keddie, was the scene of a veritable bonanza. There are no official records extant, but estimates of the gold taken from this one spot range from 14 million to 23 million dollars.

The old histories record that in July of 1850 a man named Greenwood realized $2900 from two pans of gravel from the river bar, whence the name Rich Bar. Thereupon a stampede of gold seekers ensued and Rich Bar's population rose to 2500. "So rich was the gravel," says George Mansfield in a booklet on the Feather River Canyon, "that claims on the bar were limited to 10 feet square."

In the later gold boom days, when the chartering of the Central Pacific made railroad connection with the East seem a near reality, the Feather River Valley was considered for the route by that grandfather of Sierra railroad surveying, Theodore Judah. He ran a line through the valley of the Middle Fork, south of the present Western Pacific North Fork Route, but the construction work would have been too heavy for the pioneering railroad. Grades and operating cost were then not so important as low first cost. The Central Pacific therefore built in the American River Canyon, south of the Feather River country, and crossed the Sierras at Donner Pass, a higher crossing and a route with steeper grades than the Western Pacific.

Arthur Walter Keddie originally surveyed the North Fork Route in 1866 and campaigned for a railroad through the Feather River to such an extent that he is today known as the Father of the Western Pacific. The first definitely projected railroad along this natural grade was the Oroville & Virginia City of 1869, which was followed by many another unsuccessful project, including the San Francisco & Great Salt Lake (1892) and the Stockton & Beckwourth* Pass (1902).

When Gould took over the San Francisco company in 1905 he found a route surveyed, a route allowing easy construction and located mostly along the North Fork of the Feather River. But the maximum grade was a short stretch of 2½ per cent.

Gould chose not to use this route but to take a somewhat different line over Beckwourth Pass which would allow for a maximum of only one per cent grade. Beckwourth Pass, the lowest saddle in the Sierras for hundreds of miles in either direction, was named for Jim Beckwourth, early Indian scout. Unlike the Central Pacific, and with the necessary capital to do as he wished, Gould decided the easier grade would be worth the added construction cost.

Following the ultimatum of a maximum one per cent grade, Gould's surveyors went to work. Down from the pass they flung a line across Sierra Valley, leading into the Middle

* Many references spell this *Beckwith*.

Keep 'em reading!

Would you like to add to the pleasures of the men in training? Then why not donate a year's subscription to TRAINS to the library of some army camp or naval training station? For every subscription thus donated, the publishers will match it with a year's subscription to THE MODEL RAILROADER, a monthly publication devoted to the popular men's hobby of scale model railroads, thus giving the library *two* magazines for the trainees' use each month. To be eligible for the free MODEL RAILROADER subscription, the TRAINS subscription must be addressed to the camp or training station *library*, not to an individual.

Guy Dunscomb.

Rolling the freight east.

South of Oroville in the Sacramento Valley, Mikado No. 307 rolls Train 82 toward Feather River Canyon and the climb over the Sierra Nevadas. Even in the nearly level valley some heavy cuts were used to reduce grades and curves.

Fork of the Feather River. But the natural grade this way grew too steep, so the line was swung across a divide into the North Fork Valley. This necessitated the expensive 7343-foot-long Spring Garden Tunnel. Even then the natural grade was too steep, so the engineers created Williams Loop, a complete circle of track nine-tenths of a mile in circumference, by which the line drops 45 feet.

Because the Feather River Canyon is very rugged, and because its sides are steep, the making of the line survey and the driving of location stakes involved great hazards. It is a fact that the surveyors had to be let down the faces of cliffs by ropes. Harry Ardley, now with the industrial department of the Western Pacific, worked as a helper when the surveys were being made. He says that at one time he and a transit were being lowered by rope. "It was tough going," says Ardley. "I arrived at a point where either I or the transit had to drop to the bottom of the canyon, and so I let the transit go."

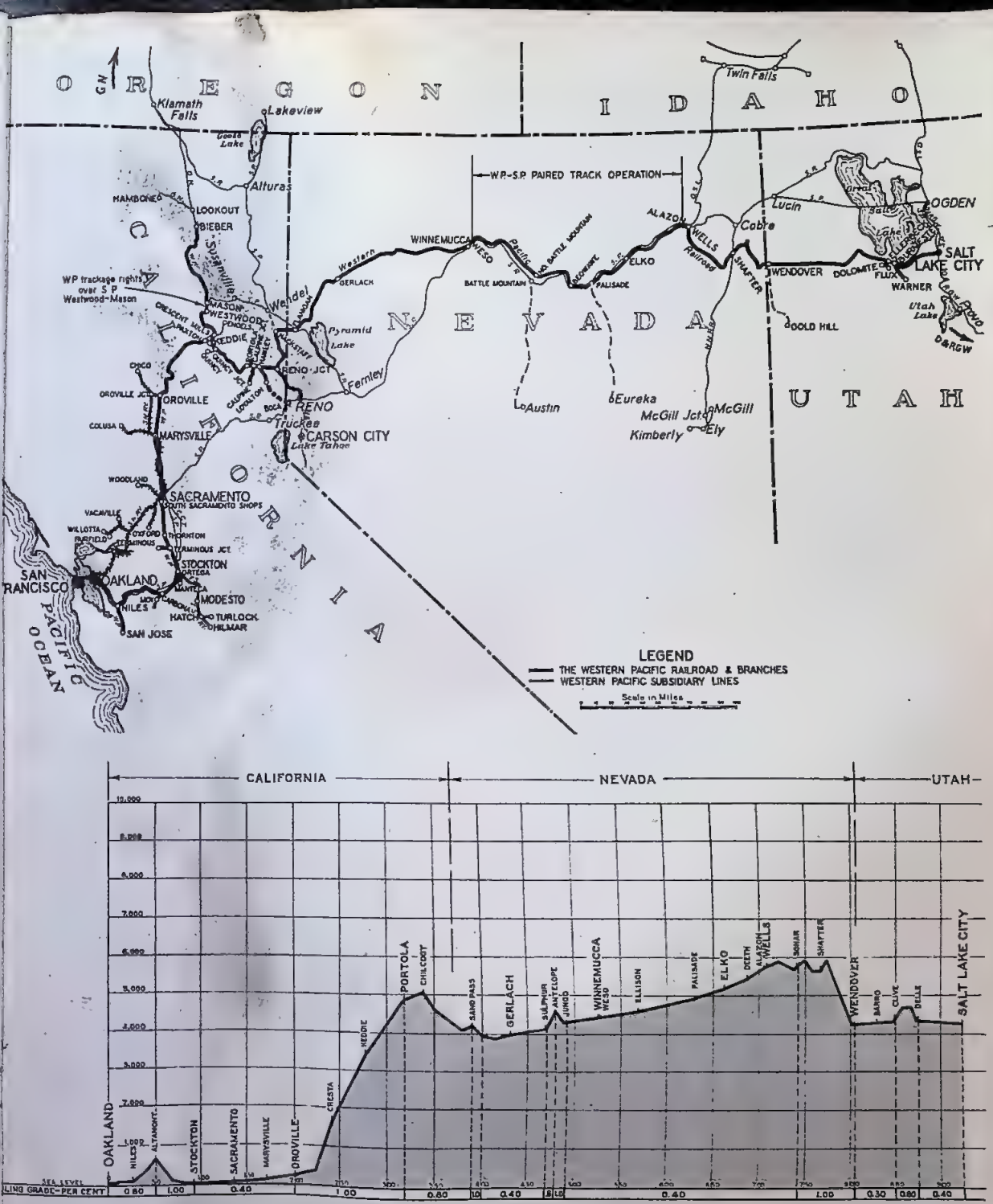
The detailed choice of route on the west slope of the Sierras was much influenced by snow records. Southern Pacific has miles of snowsheds on its Donner Pass Route, and is often faced with 20-foot drifts. Western Pacific, coming in to fight under competitive odds, couldn't risk the high operating expense of continued snow fighting, so the engineers put as much of the line as possible on the sunny side of valleys, knowing that the snow in mountains doesn't come all at once, but is an accumulation of unmelted snowfalls from many weeks. Using their advantage of many years of snowfall records, they also found that snowfall in the Sierras is a local matter, and that certain areas seem to attract snow while other places seem sheltered from it. So they located the Western Pacific in such a way that it has but 50 miles of bad snow, and seldom more than two feet of depth.

Across the mountain-sprinkled Nevada plateau the route was clear. The Humboldt River cuts across the center of the state from east to west, and although Southern Pacific already occupied the valley, Western Pacific found room to squeeze in another location. The two single-track lines are, in fact, so nearly parallel that since March 7, 1924, they have been used jointly as double track, the Western Pacific for all eastbound moves and the Southern Pacific for all westbound moves.

At the east edge of the Nevada plateau, snaking down from the Toana Mountains into the Great Salt Lake Desert, the engineers met another obstacle to the maximum one per cent grade. The natural location called for three per cent. But the men with the rod and transit swung wide to the north along an escarpment, and laid out Arnolds Loop, really a horseshoe curve, averaging some 2000 feet across but at one spot only 250 feet between the calks. The salt flats, bed of old Lake Bonneville, giant inland sea of which Great Salt Lake is now the largest remnant, are crossed with a 43-mile continuous stretch of straight track.

Many a famous racer has set new world records for automobile speed on hard shelled portions of these flats which, in the moonlight, look like another inland sea. Railroad construction here was no small problem. Workmen walked out on planks to lay the first ties and on the skeleton track gondola cars were gingerly pushed forward to dump ballast material which was worked under the ties to form a wide, firm base. Solid bottom is at some points beneath 14 feet of oozy mud.

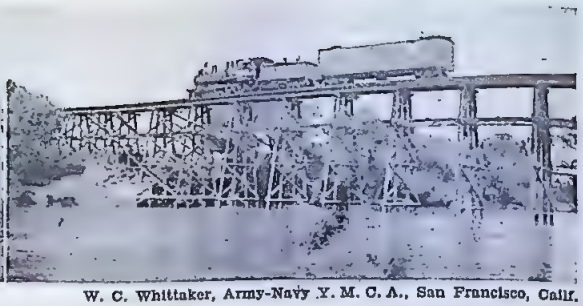
THE operation of the road received as careful engineering attention as the location. It was carefully figured, for instance, that Consolidation locomotives could move 1000-ton freight trains up the one per cent grades,



The Western Pacific, trackage and main line profile.

Across Utah, Nevada, and California stretch two railroads: Southern Pacific from Ogden to San Francisco, and Western Pacific from Salt Lake City to San Francisco. The Southern Pacific is shorter, 786 miles against the WP's 928 miles, but Western Pacific has less grade. The ruling grade is one per cent, and to cross the rugged Sierras without exceeding one foot rise for every 100 feet is an engineering feat of first magnitude. As the profile shows, the Sierras are not the highest summit on the line, but because they rise almost from sea level they are by far the most difficult barrier. The apparent deviation from a consistent one per cent grade up the 100-mile-long Feather River Canyon is because the grade must be reduced to compensate for flange resistance on curves.

Guy Dunscomb.



W. C. Whittaker, Army-Navy Y. M. C. A., San Francisco, Calif.

Western Pacific bridges.

In Altamont Pass, through the Coast Range southeast of Oakland, the crisscrossing of Western Pacific and Southern Pacific (left, withWP on the bridge) offers a spectacular sight. The overbridge in the background carries a new superhighway. The wooden trestle is over the Tuolumne River, on Tidewater Southern, WP subsidiary south of Stockton. The next photo is near Keddie in the canyon, showing the main line (foreground) and the Northern California extension (background). The highway arch, with Western Pacific trusses below, is in the Feather River Canyon near Pulga.

and that while double-headers could move 1700 tons it would be cheaper to use single engines and standardize on 1000-ton trains over the mountains. Division points were placed as close to the 100-mile average as was consistent with good water supply, crew quarters, and so on. A stretch too much more than 100 miles would mean excess overtime for freight crews. A standard design of engine terminal was adopted, with the lead tracks to the turntable lining up exactly with some of the roundhouse tracks on the opposite side. The Oakland terminal, cleverly arranged in a cramped space between two Southern Pacific lines, included a loop for turning passenger trains. The price of coal and oil per b. t. u. was computed, including freight to each division point, and oil was picked as standard fuel west of Winnemucca, Nev., while coal is standard east of there.

The grade was cut through the hills and laid across the desert flats from many a focal point. Except for heavy bridge work which awaited the coming of the rails, the substructure was finished far ahead of track laying. The steel was 85-pound section, new for the main line, second hand from D&RG for the sidings. West crept the track from Salt Lake City. Tri-weekly service was inaugurated into Nevada. The power shovels and electric draglines were still biting into the Coast Range at Altamont Pass, southeast of Oakland, and dynamite still resounded in the depths of Feather River Canyon.

The first locomotives, 20 for construction purposes and original end-of-line traffic, came from Baldwin. Then came the fleet, from American. The road was equipped completely new at the start, 88 brand new locomotives, a tremendous advantage over competition using a variety of locomotives of various vintages. But what a disadvantage later on, when the WP roster showed a preponderance of 1908 vintage power, and when on other railroads larger locomotives, superheated, were replacing the older power! Fortunately, Western Pacific started business right at the beginning of the steel car era, and so its passenger equipment was right in step for many years to come.

Thus was a new railroad born, track, stock and locomotives. But even with the fine construction, even with the brand new locomotives, even with the favorable Eastern traffic connection, it couldn't pay its way. The time came, all too soon, when Western Pacific defaulted on its first mortgage bonds, and sued the Denver & Rio Grande for its guarantee of interest and sinking fund payments. This threw both roads into receivership, and lo and behold, the upshot of it was that Western Pacific, the child of the D&RG, turned about and bought its parent for five million dollars at foreclosure sale!

There came, as there usually does between competitors who have proved their mettle, a period of amicable understanding between Western Pacific and Southern Pacific. The agreement of March 7, 1924, in addition to providing for joint double-track operation of 182 miles of track in Nevada, also provided

W. C. Whittaker.

Western Pacific.

that Western Pacific would act as a bridge for Southern Pacific traffic between Chico (via Sacramento Northern) and Weso, Nev., and guaranteed a minimum over this bridge of one-half of all Southern Pacific traffic between Oregon and Ogden, excluding perishables and livestock. Further, the SP would act as a bridge for the Western Pacific between Suisun and Sacramento. At that time Suisun was on an entirely isolated section of the Sacramento Northern. The deal also included a sale to Pacific Fruit Express of all Western Pacific refrigerator cars, and a guarantee by that company of Western Pacific's refrigerator car supply. That's how the WP herald came to be emblazoned on Pacific Fruit Express cars.

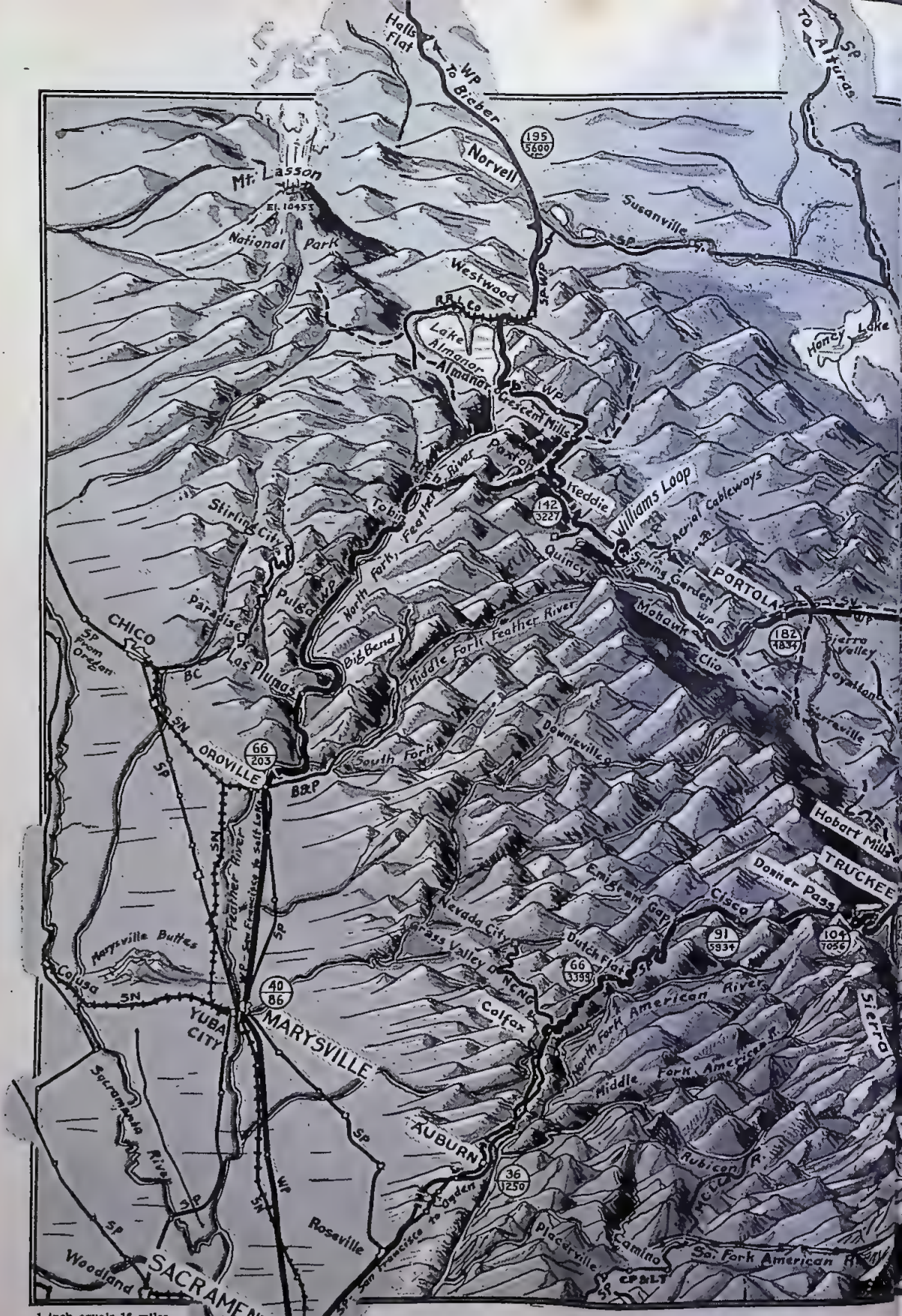
Thus ended an era for Western Pacific.

Arthur Curtiss James is dead. But he lives on in the Western railroad picture of today. For Arthur Curtiss James was the last of the great railroad builders, the last successor to the heritage of Colis P. Huntington, E. H. Harriman, and James J. Hill. And it was Arthur Curtiss James who made the Western Pacific the railroad it is today.

James was the son of one of James J. Hill's chief lieutenants, born with railroading in his blood and money in his pocket. It was he who built the El Paso & Southwestern, hoping to push it through to the Pacific Coast. And when it was blocked, he sold it to Southern Pacific, in 1926, for a fortune in stock and bonds. This made him the largest individual stockholder in Southern Pacific and gave him the capital to buy Western Pacific. He was a firm believer in the future of the West, and he felt that Western Pacific could be built up as an independent competing railroad. No time was lost putting theory into practice. A vast improvement program was inaugurated: more modern power, widening of subgrade, deeper ballast, new rail, more ties. The network of branches projected in 1905 had never been built, and Western Pacific lacked feeders, while its big competitor extended fingers into every town of size in central California. So James revived branch line projects, and improved the WP-owned electric line, Sacramento Northern [March 1941 Trains], which gave Western Pacific connections spreading well over the Sacramento Valley. An all-rail route into San Francisco, via Niles and Redwood City, was even projected and authority was asked of the Interstate Commerce Commission.

The Southern Pacific — Arthur Curtiss James, largest stockholder—fought Arthur Curtiss James' Western Pacific every step of the way. Its offer to haul WP carload traffic into San Francisco was instrumental in finally killing the San Francisco extension. But it could not block the biggest venture of the James regime, the Northern California extension.

Southern Pacific had been the only connection between California and Oregon. Way back in 1909 Great Northern struck south through the Des Chutes River Valley with its Oregon Trunk Railroad, but this only reached to Bend, Ore., far short of even the California state line. Now, with James on the board of many a railroad, including Great Northern, Burlington, and D&RGW, there was a new community of interest, and the Great Northern's plans to reach California were linked with Western Pacific's plans to stretch north. Despite SP opposition and its construction of a parallel line to the east, the I. C. C. agreed that a competitive north and south route would be a good thing, and the lines met at Bieber in 1931 with James driving the golden spike. Three years later came the Dotsero Cutoff on the D&RGW [January 1942 Trains] and the community of roads had a



1 inch equals 16 miles.

Linn H. Westcott.

Trains map of the upper Sierra region.

This is the territory in which the Western Pacific and the Southern Pacific wage their war against grade and curvature to conquer the Sierra Nevada Mountains. East and north from Sacramento, in the great Central Valley of California, run the railroad lines, up and over the mountains that try to bar them from reaching the East and the Northwest. Sacramento is 92 miles from San Francisco via Southern Pacific, 139 miles along the WP. The little circles along the railroad lines on the map represent the mileage from Sacramento, upper number, and the elevation in feet above sea level, lower number. The Sacramento Northern's electric lines radiating from Sacramento are indicated by cross ties. Heavy solid lines indicate main transcontinental steam railroads, narrower lines other mains or branches, and dashed lines represent abandoned roads, most of these in the territory being ex-lumber roads. Favorite small lines for fan trips are the Virginia & Truckee and the Nevada County Narrow Gauge.

transcontinental route comparing favorably with any competition.

The western end of the old Gould empire had been built far better and with more strategic connections than Gould had even dreamed. Now, as the *Exposition Flyer* streaks from Chicago to San Francisco on a schedule equal to any other no-extra-fare train, it is a living monument to Arthur Curtiss James. And as separate roads with strong traffic alliances but no Eastern ownership connections, the Burlington-Great Northern-Missouri Pacific (MP now joins with WP in 50-50 ownership of D&RGW)-Denver & Rio Grande Western-Western Pacific group is perhaps much better off in the present-day traffic strategy than would be the coast-to-coast railroad Gould visioned. Can one imagine the Pennsylvania routing a car via Western Pacific with a trunk of the same system strongly entrenched in its own back yard? An independent Western transcontinental has a much better chance fighting for its traffic among the Eastern trunk lines, and vice versa. Perhaps that's why no road has followed the Gould coast-to-coast intentions.

THE yellow reefers roll east up the 100-mile continuous one per cent grade in the Feather River Valley behind the giant 4-6-6-4 articulateds built by American in 1938, or behind the four-unit 5400-horsepower Electro-Motive freight Diesels. The company's 7768 freight cars are seen from coast to coast with interchange loads. The fulfillment of Arthur Curtiss James' vision of a growing West is seen in the fact that 43 per cent of all Western Pacific tonnage originates on the road.

Manufactured goods furnish most of the freight tonnage on the road, with 41 per cent of all tons from connections and 28.7 per cent of originated tonnage. Products of mines come next, with far more originated on the line than received from connections, and then come products of agriculture, of the forests, and finally a small two per cent of animals and animal products and about an equal amount of less than carload freight. Such single items as lumber,

shingles, and lath make up the greatest bulk, while the westbound train you pass in Nevada may be mostly soft coal. Connections in California deliver fresh grapes in quantity to make up the third largest bulk item on connecting-line billings, and sugar also rates third in on-line billings.

The seasonal variation is considerable, but approximately in line with other Western roads. Revenue for October, the maximum month, is about twice that for February.

Passenger business, despite the magnificent Feather River Canyon, is a small matter. There is only one through train each way daily, the *Exposition Flyer*, and another train each way as far as Portola, at the head of the canyon. This last train is the *Feather River Express*. A local runs between Portola and Reno, and the Loyalton Branch sports a mixed tri-weekly. Through passenger service from the Pacific Northwest was planned for the Northern California extension, and application was made with the I. C. C. to run such a service. The depression caused withdrawal of the application in 1933, and the only passenger service on the line is Winter sports specials run to Lake Norvell, 52.5 miles north of Keddie on the main line. Lake Norvell is in a high mountain meadow, virtually on the summit of the Cascade Mountains, and is an ideal site for snow sports, including skiing, tobogganing, and ice skating.

Motive power to move the traffic includes 168 locomotives, 102 of which date from 1920 or earlier. The most unusual specimens on the roster are the 170-series Mountain types, used for fast passenger trains. These seem a bit out of place with the other power, and indeed they are. In 1936 the Western Pacific purchased the 10 sleek 170's from the Florida East Coast Railway!

The rolling stock lists 8 dining cars, 53 other passenger cars, 398 ballast cars, 555 other work cars, and 7768 freight cars. Unlike the locomotives, the bulk of these date from 1921 to 1925.

THE *Exposition Flyer*, pride alike of the Burlington, the Denver & Rio Grande Western, and the Western Pacific, was scheduled so that its westbound run would take advantage of the scenic highlights of each of the lines. Unlike earlier WP passenger jobs, which went through the much-exploited Feather River Canyon in the dark, No. 39 leaves Portola at 12:55 p. m. and slides down the whole length of the canyon to Oroville by 4:30. Here is a truly exceptional train ride and the best way to see the Western Pacific.

Lying awake in his berth on the westbound *Flyer*, the traveler is introduced to the Western Pacific at midnight (mountain time) as he hears the sound of switching and engine-changing at Salt Lake City. The night before it was a huge 4-8-4 with Rio Grande splashed across the tender. The next morning it will be one of the 170 series ex-Florida East Coast 4-8-2's on the front end as the train swings wide on the curves leading into the Humboldt River Valley.

It's 11:35 p. m., Pacific time, when the conductor lifts his lantern and No. 39 leaves Salt Lake City. Straight west run the tracks, until, lifting the shade, one can see the Great Salt Lake stretching north in the moonlight. Western Pacific is built right on the south edge, so close that much trouble was experienced at first because the small, but insistent, waves wore down the rock riprap along the embankment and continually threatened to slide the railroad into the inland sea.

It's still too early in the morning for anyone but a milkman when the train pauses briefly at Shafter, Nev. Here the Western Pacific crosses the Nevada Northern, which runs 121 miles south to Ely, location of some of the richest copper mines in the world. There is no longer passenger service on this railroad but it's still handling a very healthy freight business. Apparently at one time high hopes were held for it, as an early prospectus of the Western Pacific mentions the possibility of the Nevada Northern extending to Los Angeles and providing the WP with a valuable connection. (This wasn't WP's only hope for getting to Los Angeles. Plans were made for extending south in the San Jouaquin Valley from Stockton to Los

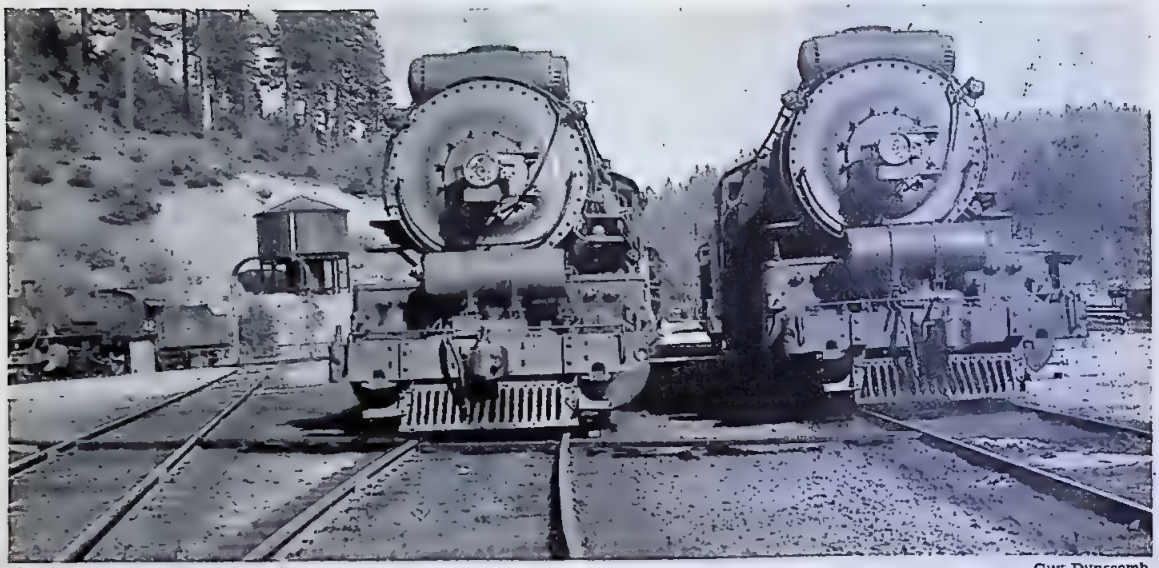
A penny a ton-mile.

To buy a three-cent postage stamp it takes all the income a railroad receives for hauling an average ton of freight three miles.

Lieut. E. W. Bewley, from Allston Railroad Photographs, 47 Royal St., Allston, Mass.

Rain on the Nevada desert.

The engine of the westbound *Exposition Flyer* frames this view of the eastbound *Flyer* pulling into the siding at Ascalon, a meeting point and nothing much else out on the desert east of Gerlach, Nev. A brief thundershower has drenched the usually dry, hot sand, and puddles reflect the dramatic clouds and the distant peaks. The locomotives are both ex-Florida East Coast Mountain types of the 170 series.



Alco (1917) Mallets at Keddie, Calif. Guy Dunscomb.

Western Pacific motive power roster.

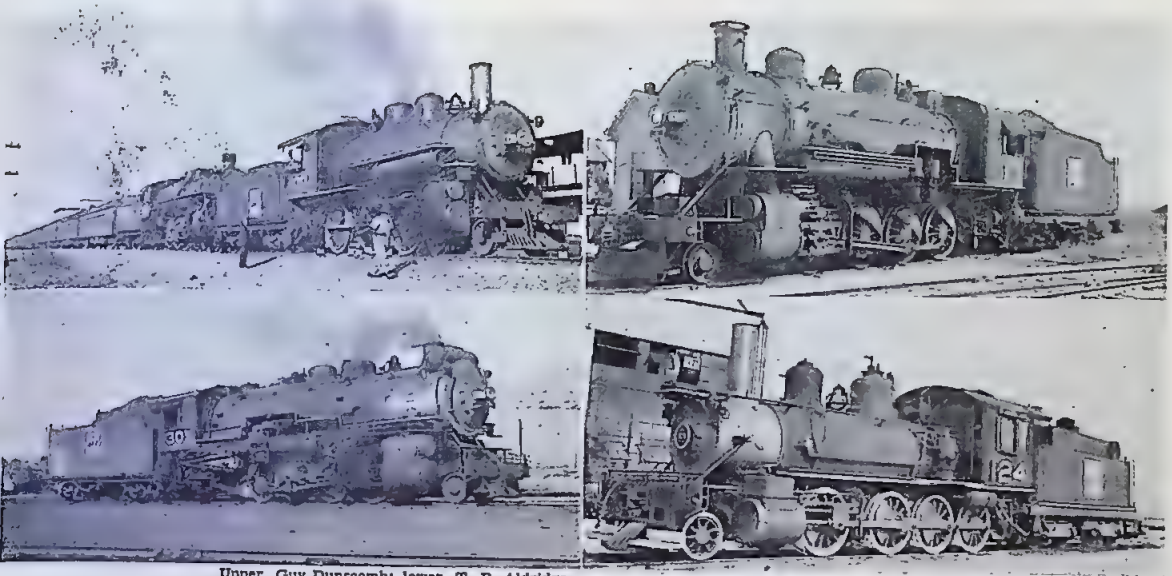
Nos.	Type	Fuel Oil	Fuel Coal	Driver dia.	Steam Pressure, Pounds	Cylinders, D. and S.	Tractive Effort, Pounds	Weight, Pounds (with tender)	Built*	Notes†
1-20	2-8-0	14	6	57″	200	22″ x 30″	43,300	364,000	B-'06	s s '37.
21-65	2-8-0	44	-	57″	200	22″ x 30″	43,300	385,000	A-'09	43 s '34.
71-85	4-6-0	6	2	67″	200	21″ x 26″	29,100	319,000	A-'08	72-75, 79, 80, 82 s '37.
86-106	4-6-0	3	2	67″	200	21″ x 26″	29,100	316,000	A-'09	91 s '34; 87, 88, 90, 92, 93, 95-98, 100-105 s '37.
121-122	4-6-0	1	-	57″	150	18″ x 24″	17,400	190,500	R-'96	f Alameda & San Joaquin Nos. A-1 and A-2. 121 s '34.
123	2-6-0	-	-	50½″	135	16″ x 24″	14,000	116,000	B-'76	f V&T No. 23, Boca & L No. 4 s '30.
124	2-8-0	-	-	50″	150	19½″ x 24″	23,300	178,000	B-'82	f Boca & L No. 5.
125	4-6-0	-	-	51″	160	18″ x 24″	21,900	160,000	P-'88	f Boca & L No. 7 s '34.
126-127	4-6-0	-	-	55″	160	18″ x 24″	19,228	198,400	Ro-'91	f D&RG Nos. 546, 549. Bought '17. 126 now TS No. 1, 127 s '30.
151-162	0-6-0	12	-	51″	180	20″ x 26″	31,200	267,630	A-'09	
163-166	0-6-0	4	-	51″	180	21″ x 26″	34,400	262,500	A-'15 and '19	f United Verde Copper Co. Nos. 9, 86-88, bought '27.
171-180	4-8-2	10	-	73″	200	26″ x 28″	44,100	515,000	A-'24	
201-205	2-6-6-2	5	-	57″	200	23½″-37″ x 32″	80,000	641,660	A-'17	
206-210	2-6-6-2	5	-	57″	200	23½″-37″ x 32″	80,000	637,460	A-'24	f FEC Nos. 403-408, 410, 412, 414, 415, bought 1936.
251-256	2-8-8-2	6	-	63″	250	26″-26″ x 32″	137,000‡	1,073,350	B-'31	
257-260	2-8-8-2	4	-	63″	250	26″-26″ x 32″	137,000‡	1,066,450	B-'38	
401-407	4-6-6-4	-	7	70″	265	22″-22″ x 32″	99,600	991,500	A-'38	
301-305	2-8-2	-	5	63″	200	28″ x 30″	60,300	534,600	A-'18	
306-310	2-8-2	-	5	63″	200	27″ x 32″	60,000	530,550	A-'19	f EJ&E Nos. 802-806 (U. S. R. A. heavy) bought 1920.
311-315	2-8-2	-	5	63″	200	28″ x 30″	60,300	536,900	A-'21	
316-321	2-8-2	6	-	63″	200	28″ x 30″	60,300‡	506,400	A-'23	
322-326	2-8-2	5	-	63″	200	28″ x 30″	60,300‡	518,600	A-'24	
327-331	2-8-2	5	-	63″	200	28″ x 30″	60,300‡	594,000	A-'26	
332-336	2-8-2	5	-	63″	200	28″ x 30″	60,300‡	599,000	A-'29	

* B, Baldwin; A, American; R, Richmond; P, Pittsburgh; Ro, Rome; '09, 1909, etc.

† s-scrapped, f-formerly.

‡ Boosters of 13,900 pounds are equipped on engines 251-260, 11,000 pounds on 322-336.

Roster courtesy T. B. Aldridge, P. O. Box 163, Wendover, Utah.

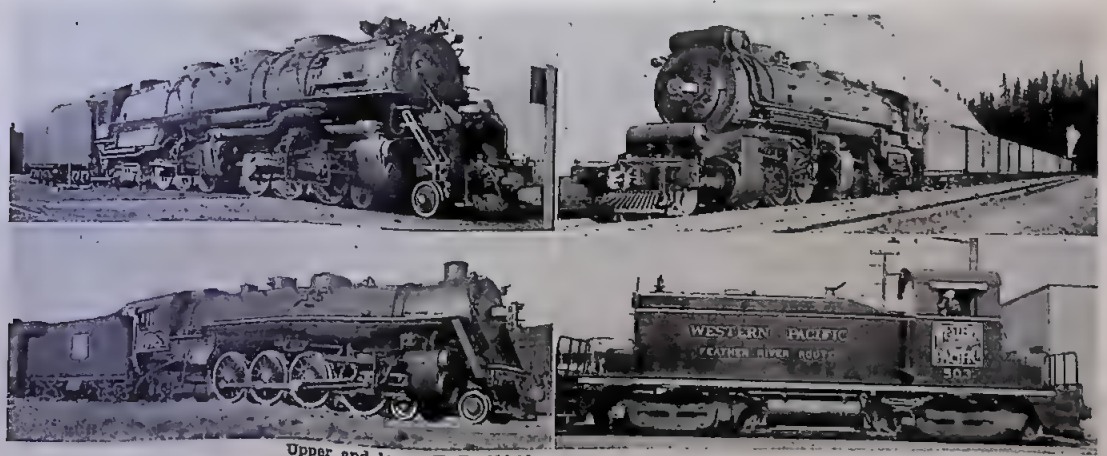


Upper, Guy Dunscomb; lower, T. B. Aldridge.

Upper, T. B. Aldridge; lower, W. C. Whittaker.

Photos of representative Western Pacific locomotives.

The gold dust twins on the opposite page are locomotives 202 and 204 on the roundhouse tracks at Keddie. These are articulated engines of the true Mallet type, compounds with low-pressure cylinders for the front drivers and high-pressure cylinders for the back set of drivers. Mallets have gone out of favor in recent years, deferring to the simple articulated with all cylinders using steam right from the boiler. They are essentially slow-speed engines, and are still mighty good for pusher service on heavy grades. Ten-Wheeler No. 77 helps Mountain type 179 on a passenger extra (left, above). Next to it is No. 1, really the WP's first locomotive, built by Baldwin in 1906 as part of an order of 20. No. 301 is an Alco-built Mikado, equipped for coal burning on the eastern reaches of the road. No. 124 used to be the Boca & Loyalton No. 5, built by Baldwin in 1882, and is shown outside the Stockton engine house. The 402 (left top of lower group) represents a general type of locomotive that has become very popular for fast heavy service and is the WP's latest steam power. Such widely separated roads as Union Pacific, SP&S, Northern Pacific, Western Maryland, D&RGW, and Delaware & Hudson have gone in for these flexible, powerful 4-6-6-4 articulateds, which are of as much all-around use as the 4-8-4 type for lighter service. The 208, Mallet articulated, is ready to leave Keddie for Bieber, over the Northern California extension. A helper engine is cut into the train 10 cars back. Western Pacific passenger power is kept in trim shape, like the 175 below, with white-edged running boards and white-rimmed wheels. This is one of the 10 engines purchased from the Florida East Coast only six years ago, the only heavy passenger power on the WP. Three Diesel switchers are in service, along with two 5400-horsepower, four-unit road freight Diesels. Another 5400-horsepower job is on the way.



Upper and lower, T. B. Aldridge.

Upper, Guy Dunscomb; lower, W. C. Whittaker.

Western Pacific stations.

Typical of way stations along the WP are those at Clio, on the main line below Portola, and at Norvell on the Northern California extension. Norvell is a popular Winter sports center, and the only passenger service on the extension is run here in Winter for sports enthusiasts. The two separate photos of Clio join to give the effect of one shot, the left view showing more of the broad upper Feather River valley, and the other showing the trackwork.

Guy Dunscomb.

Angeles.) If he's awake at 4:15 in the morning, and if an early Summer sun will permit him to see the right of way and structures, the sharp-eyed traveler may notice a change, for west of Wells the *Exposition Flyer* will be running on the tracks of the Southern Pacific. From Wells to Winnemucca both railroads follow the valley of the Humboldt River, winding from side to side in its canyon and sometimes cutting beneath sharp rock palisades. The Southern Pacific track is used for all westbound trains and the Western Pacific track for all eastbound trains of both roads. So here is a Western Pacific train stopping at Southern Pacific stations, controlled by the typically Southern Pacific semaphore signals, and perhaps passing side-tracked Southern Pacific freight trains. The two tracks are quite close together most of the way. Battle Mountain on the Southern Pacific and North Battle Mountain on the Western Pacific are the stations farthest apart, the distance being about five miles.

The paired operation continues until about 8 o'clock, when the train reaches Winnemucca. The smart traveler has timed his breakfast so that he can get off the train at this station and walk up and down the platform while the engine takes water. The dry Nevada air is a treat, Winter or Summer.

Now the railroad climbs from the Humboldt River Valley, edging westward into the desert while the Southern Pacific disappears to the southwest. Distances here are deceptive. From Gerlach, 94 miles west of Winnemucca, a gypsum plant seems hardly a mile away to the south and yet it is five miles off! The utterly lifeless and arid earth seems to stretch endlessly to distant mountainous horizons. It is practically trackless, with automobile tire imprints occasionally leading a path in one way or another. Sometimes medium sized or even quite large lakes can be seen from the train. At other seasons of the year these lakes dry up completely. As the track winds on into hillier country, closer to the Sierra

Guy Dunscomb.

Along the line.

Typical of the lower Feather River Gorge is this bird's-eye photo of an eastbound freight rounding the curves near Pulga, taken from the

Western Pacific.

W. C. Whittaker.

Hugh Dougherty, San Leandro, Calif.

Nevadas and the California-Nevada state line, Pyramid Lake appears toward the southeast. This is the last remnant of prehistoric Lake Lahontan, which extended several hundred miles and had a depth of 880 feet.

Somewhat before noon and some 10 miles west of the view of Pyramid Lake, the Western Pacific crosses, at an acute angle, the Southern Pacific Alturas Line, a short-cut connection between the Southern Pacific's main line in Nevada and its Cascade Line in Oregon. Far across the desert there may be a powerful cab-forward articulated pulling a long SP freight train.

Angling up the barren and steep east slope of the Sierra Nevada Mountains, with a ruling grade of only eight-tenths of one per cent, the Western Pacific reaches Reno Junction and the east portal of the Chilcoot Tunnel, in which it crosses the summit at 5018 feet above sea level. The Reno Branch of the Western Pacific is 33 miles long and is operated primarily for freight service. About 15 miles of this is on the right of way of the old Nevada-California-Oregon Railroad, which was a narrow gauge line running from Reno to Lakeview, Ore., via Plumas Junction and Hackstaff. There was a branch line from Plumas Junction to Clio, Calif., in the upper Feather River Canyon. WP purchased the line between Reno and Hackstaff and the branch between Plumas Junction and Clio. The latter was eventually abandoned. Total mileage acquired by WP was 105 miles. The Southern Pacific purchased the remainder of the line from Hackstaff to Lakeview, but most of this has been relocated and made standard gauge, some parts abandoned.

Reno Junction first was named Rainbow. The story of how it came to be so named

steel arch highway bridge shown on page 32. Next is a section of the Bonneville salt beds in western Utah. The isolated division point on the snow-covered, mountain-fringed plain is Bieber, Calif., joining point of Western Pacific and Great Northern on the north-south extension which brings GN into central California over WP rails. The photo at right shows palisades in the Humboldt River Canyon.

W. C. Whittaker.

Western Pacific.

comes from the correspondence of Virgil Gay Bogue, chief construction engineer when the railroad was built:

> "A few days ago, having inspected the progress on Chilcoot Tunnel, and having had a very hard day, I walked over the surface of the ground. It had been raining all day, but as I neared the eastern portal of the tunnel, the sky cleared and there was a beautiful rainbow. I took this as a good omen and a promise that our efforts would be crowned with success."

Coming out of the west end of Chilcoot Tunnel, a startling change is evident. The western slope of the mountain has much more vegetation. In the broad mountain-rimmed Sierra Valley, the Western Pacific rolls westward down an easy grade to Portola, division point and top of the famed 100-mile one per cent grade of the Feather River Canyon.

Below Portola the valley starts in earnest. First it seems but a pretty wooded glade, and then it gradually widens out and becomes more rocky. Blairsden, 11 miles below Portola in Mohawk Valley, is the starting point for trips to Johnsville, which lies in the shadow of Mount Eureka, where the famous Plumas-Eureka mine was discovered in 1851.

Just when the train is really getting into a deep valley, it dives into the 7343-foot-long Spring Garden Tunnel, in the construction of which engineers were compelled to fight for months against obstacles such as boulders and sands of an ancient river-bed and the waters of an underground stream. When the line emerges into the North Fork watershed it is in a beautiful high mountain meadow surrounded by forest trees, and but a short distance farther swings about this meadow in the famous Williams Loop.

Quincy Junction at milepost 288 (reading from San Francisco) is the junction point for the Quincy Railroad, which leads off in a southwest direction to the little city of Quincy, in the American Valley, protected by pineclad mountain slopes and snow-capped peaks. Although it is five miles distant, it can readily be seen from the Western Pacific. Quincy is headquarters of the Plumas National Forest.

Below Quincy Junction the train plunges through a long tunnel and then the railwise traveler starts to keep his weather eye pealed for Keddie. Here the railroad jumps from the north to the south side of the valley over one leg of a high steel wye bridge. The other leg of this wye bridge carries the track for the Northern California extension by which the Western Pacific connects with the Great Northern. For a mile or so the tracks of the Northern California extension can be seen climbing along the opposite side of the canyon.

By comparison with the early days, Rich Bar, which once was a trading post and principal town in the Feather River Canyon of the gold rush era, is now a ghost town. However, a number of persons still dwell at Rich Bar, which has a little hotel-resort; and the old diggin's are still being worked.

Fishing abounds and, in fact, Tobin, at milepost 253, is one of the many points in the Feather River country which has caused it to be known as the paradise of trout fishermen.

The truly rocky character of the canyon becomes more and more evident in its lower regions. It is practically a rock gorge at points, and the train snakes along on a shelf blasted into the edge. Up high on the slope are the remains of one-time prospectors' cabins. Below, at the bottom of the crevice, the river foams and boils over rocks with a feathery spray rising in the sun. At Las Plumas is a power plant of the Pacific Gas & Electric Company which is across the canyon from the Western Pacific Line. The water comes through a three-mile tunnel from a dam 11 miles farther up the river.

More suddenly than it began, the deep rocky gorge flattens out into a tranquil wooded ravine and the train pulls into Oroville. This is at an elevation of 203 feet above sea level, and the descent from the Sierras is accomplished.

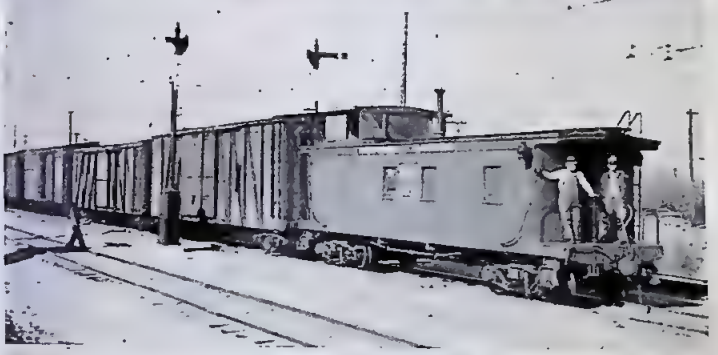
From here the Western Pacific track points nearly straight south across the smooth valley through Marysville, Sacramento, and Stockton—crossing, recrossing, and at times using tracks jointly with the electric Sacramento Northern. From Stockton the road turns west, crosses the summit of the Coast Range at Altamont (a great mountain pass in miniature), threads and twists through Niles Canyon, and swings north into Oakland, where it terminates on a mole or ferry landing. Passenger trains have used Southern Pacific ferries and passenger facilities since 1933.

Here is a railroad conceived in the era of expansion at the beginning of the century, well built to last, and playing an important part in the commerce of a still-growing part of our country.

Guy Dunscomb.

Along the line.

The Portola roundhouse and yards seem strangely out of place against the majestic background of the snow-covered Sierras. Portola is at the top of the Feather River Canyon grade, with only rolling, wooded valleys between it and Beckwourth Pass, summit of the Sierra Nevada Mountains.



At Marysville, as at several other points, Sacramento Northern uses the same track as Western Pacific. The electric road serves as a feeder, bringing carload and less than carload traffic from many a place not on the Western Pacific main line.

The western end of the main line at Oakland is sandwiched tightly into a builtup city area. Formerly the road ran its own passenger ferries to San Francisco, but this connection is now via Southern Pacific ferry.

Freight to San Francisco still crosses the bay on Western Pacific's own car floats. Construction of an all-rail route around the south end of the bay was authorized by the Interstate Commerce Commission in 1931, but the depression intervened.

W. C. Whittaker, Guy Dunscomb, W. C. Whittaker.

SPIKING THEIR GUNS!

American industry is busy today spiking the guns of the foes of freedom.

And in that job you can count the American railroads right up toward the head of the list.

They're hauling more tons more miles per day than ever before.

They're making every piece of equipment do more work than ever before—and are pouring earnings back into more equipment to do their job even better.

That's why we say, one of the biggest spikes in the Axis' guns will be a railroad spike.

They started this "war of movement"—and now they're going to find out what movement really means in the U. S. A.

* * *

APRIL P.S. PERFECT SHIPPING MONTH

Good packing, secure loading and careful handling will conserve time, materials, money, and will help win the war. We can't afford waste now.

ASSOCIATION OF AMERICAN RAILROADS

WASHINGTON, D. C.

Letters

★ Interesting sidelights on railroads as readers observe them.

Railfan's Big Thrill.

THERE is only one day bigger in the life of a railfan than the one on which he takes his first ride in an engine cab, and that is the day when he is told to take over the controls and run the engine. Such an opportunity came to me a little over a year ago, and perhaps, because it was on a unique little railway off in the land of rice and sarongs, it may interest you. The road involved was only about 2'-3" in gauge, but the locomotive was a bona fide Mallet compound with two tenders.

I had been invited to inspect the sugar plantation of one of the largest firms exploiting the products of Java—perhaps the largest sugar estate in the world. It has about the greatest mileage of industrial railroad to be found, some 300 kilometers of 70-centimeter track serving two adjoining estates. It maintains 56 locomotives, about 40 of which are 60- and 80-horsepower 0-4-4-0 Mallets and the remainder three- and four-coupled simple engines, all but two of which are of German manufacture. The two are Baldwins.

Aside from the power, the company has about 2000 four-wheel racks to convey the sugar cane, and an assortment of gasoline inspection cars, an ambulance motor car, a passenger motor car, two box cars, and an ordinary open-end passenger coach. The passenger cars are used to carry school children from their homes on the estate.

Track is built in sections and is laid temporarily in the fields convenient to where cane is being cut. At the end of the season this track is taken up and stored in the yards. The "main line" is laid permanently around the various fields, and the system is laid out in a series of loops between the two factories, to prevent frequent meets and turning of engines. While all of them are tank engines and do not require turning, in practice they are operated with two tenders. The engines burn dried sugar cane compressed into bales convenient to handle. This material is light and clean, but it burns rapidly and must be fed into the fire box constantly. Thus a considerable bulk of it must be carried and a whole tender is needed to transport it. To enable the engines to be out for considerable time and to avoid piping water over the system, a tank is carried behind the fuel tender. Thus you have a two-car train to start with.

I went to the shops and photographed several of the engines and asked questions about them, and apparently these questions impressed the chief engineer that I had considerable contact with locomotives. Almost any railfan can out-talk a professional railroader! When the time came for me to inspect the line, the brass hat (in this case a pith helmet) suggested that I take an engine out myself.

Like all engine bugs, I knew what the principal controls were for, and, unlike most of them, I have been building and operating steam locomotives myself—scale models—so I figured that if they showed me where the steam brake control was I could keep this baby off the ground. I had previously spent

Courtland Christiani.

Engine and tenders. Because sugarcane fuel burns rapidly and is bulky, one tender is required to carry nothing but fuel, with the water tank on a separate chassis. Someone apparently switched tanks during shopping; notice that engine 75 carries tank 43.

the greater part of two days riding the cabs of locomotives on the Java State Railways, and I hadn't spent the time with my eyes shut.

We started out with a man from the office, who was to introduce me to the officials at the other end; the regular driver, who acted as fireman; and the regular fireman, who got into the tender and passed the bales forward. There was a chute running from the tender to the firebox door, through which a constant stream of fodder was slid, and this chute divided the cab in two so that the regular driver, on the fireman's side, could not have got to the throttle had he wanted to without some difficulty. They were natives and would probably have let the engine turn over before interfering with a "European," anyway.

Well, I threw the reverse lever all the way over and gave her the steam, and the little Mallet started out just as if her master were all broken out with seniority. I soon gained experience in stopping and starting her, for nearly every switch was set against us, and the fireman was kept busy running ahead to line them up. On a sugar railway there is a siding about every 200 feet while passing through the fields, and I found this very convenient later on when I had several meets. There is no system of signaling, even on the main line, and you literally run on smoke orders.

It was not long before we met the school train, another Mallet with one car full of kids, preceded by a motor car with a half dozen more children in it, and with a native driver. I observed this outfit about a quarter mile away, running about 20 miles per hour straight at me and apparently with no intention of slowing down. They were superior to me and they knew it, but what they didn't know was that the man at the throttle was there for the first time. I saw a turnout about 150 feet ahead and I beat him to it, but there was a little complication here because the motor car happened to be taking its children along the path indicated by this turnout, so I had to get out on the main line again and let him back into it first.

The next experience was with a flat car full of sections of track, standing on the main line. By this time I had sufficient control to ease up to it and push it until we came to a siding. As I was not coupled to it would coast away from me every little while and I had to ease down to connect again when I overtook it.

On one occasion I had to make a sudden stop by reversing the engine to clear a trailing switch set the wrong way. The steam brake was operated by a handle that had to be turned a half dozen revolutions, and it was very leaky and ineffective, but I learned to operate it sufficiently in advance to stop her in time. The wood was gone from the handle and until I wrapped a handkerchief around my hand I got a lot of painful burns. Natives can rake out a fire with their bare hands.

With all due respect I think the fireman is the man on an engine with most responsibility. I was mighty glad I did not have the burden of watching the water and working the injector, which seemed to keep "my" fireman busy. The gauge was dirty and rather dark, and at no time could I see any water level in it. And it is an expert's job to feed sugar cane into the fire box evenly.

The track was very uneven and the little engine lurched and rolled, but I was running at a very conservative speed, so we stayed on the track. I remembered to cut her down for the curves and give her a run for the slight

Courtland Christiani.

Two oxpower.

Some sugar plantations find it profitable to use oxen as motive power. The estate on which this picture was taken uses several hundred teams of oxen as well as two steam locomotives and a Diesel engine. Notice the "Johnson bar" in driver's right hand.

grades just before we entered them. I guess that driving an automobile for several years gives one a familiarity of handling power that is more or less useful on an engine.

At the end of the round trip no comment was made on my driving, and this suited me, for to have given praise would have shown the workers' surprise and put me definitely in the amateur class. You don't compliment a regular engineer when he finishes a run!

Courtland Christiani.
American Consulate, Surabaya, Java.

"Disney's Engines Are for Kids."

You got out of touch with your readers in the January number: only 52 pages and 20 of those valuable pages devoted to the electric division of the Pennsy, which any fan knows about. Those 20 pages, broken up into small and forgotten lines and views, would have been interesting.

Also, Walt Disney's engines are for kids.

Granville Thomas.
P. O. Dept., Millville, N. J.

I was gratified to find the interesting article on the Pennsy's New York Division. Most of it is an old story to me. . . . In fact, the division had lost much of its glamour for me through sheer familiarity until Mr. Osborne's article brought it out in a new light.

Frederick W. Diebert.
232 N. Stevens Ave., South Amboy, N. J.

Say, that was a swell article on the Grizzly Flats! I certainly like Gerry Best's photos of the line and the drawings of *Casey Jr.* . . . I also liked the article on the Pennsy.

John W. Maxwell.
1416 Pennsylvania St., Denver, Colo.

Result of War, No Doubt.

Of interest to you and other railroad fans is the fact that I have had glimpses of two Burlington engines operating on the Southern Pacific out of Los Angeles. They were the 2113 (a Pacific, I believe) and the 1955 (a Prairie type). They carried regulation train-order boards of the Espee next to the smoke stack. Otherwise they were typically Burlington.

William Bassler.
2112 Cedar St., Alhambra, Calif.

Know Your
AMERICA

. . . The United States is beautifully portrayed in this new triumph of the map maker's art.

THE MAP is an actual colored lithographic reproduction of a raised relief, incorporating the missing link in all previous maps, height. This unique map is the creation of Theo. W. Ohman, whose work has been acclaimed by leaders of industries, educators, and other renowned map makers. He has spent many years in the development of an original process for making fine-detail relief maps and later, through his own method, created this reproduction which appears to be actually raised.

RAILROADS are shown clearly and every route of any importance (heavy lines), even many branch lines (light lines), can be followed with ease. All important stations are shown, and the relief makes it easy to tell how the railroad crosses mountains, follows river valleys.

AMERICAN GROWTH - Know your country. From this map which so well portrays the geographical features of our land learn how and why the country grew, see how early development followed the rivers, how the first railroads influenced development and why they were built; see how terrain in the early days shaped the distribution areas of today.

ARTISTIC, TOO - The map size is 36" x 23", large enough for plenty of detail and yet handy for home hanging. Each copy is artistically combined with a horizon of the United States, together with text, "Our Country," printed in five colors across the top. Key to the map is printed on the reverse side, and each map is attached to metal strips ready for hanging. Price, postpaid, $3.50.

The **Ohman Co.**
Makers of Fine Maps
MEMPHIS TENNESSEE

The Month

★ 14 complete railroads abandoned in U.S. during 1941.

★ Fourteen complete railroads were abandoned during 1941, more than in 1940 but not as many as the highest figure to date, 17 in 1939. The Wichita Northwestern, 99 miles, was the largest complete system scrapped, with the 54-mile Missouri Southern next. The passing of small independent roads is watched with nostalgia by railfans and with anguish by town boards which, in many cases, depend on the railroads for school taxes—but don't patronize them. On the whole the United States railroad system is becoming more lean and sinewy, toughened up by the removal of unprofitable portions. But there is one bad point, that every small line or branch contributes traffic to the main stem, and too many losses of a carload here and a carload there may cause serious trouble. Or it may be that industries using railroad freight will tend to concentrate more along the main lines.

Independent short lines are not in many cases faced with the biggest problem of large railroad branches, the full-crew union contract. The brotherhoods do not wish to sacrifice labor privileges on branches, for fear this may lead to reduction of main line crews. On the other hand, labor concessions might save many a marginal branch. The Kansas Corporation Commission and Commissioner Eastman of the I. C. C. have both commented on the refusal of the unions to allow a reduced crew in order to continue operation of the Missouri Pacific's LeRoy-Madison Branch. The Kansas commission said, "To permit abandonment while a branch is being operated on main line standards is simply refusing to attempt a solution to the problem. Many branch lines could be operated with one-half the amount being expended. Gas-propelled units of three, or possibly two-man crews, operating three times a week, could handle the traffic. This would be a practical operation and would save our branch lines."

★ The *Capitol Limited* of the B&O is again all-Pullman, and a new all-coach streamliner, the *Columbian*, has been added to the Chicago-Washington run. Equipment is that of the former New York-Washington *Columbian*, thoroughly renovated.

★ American plants will build 1000 locomotives during 1942, according to W. C. Dickerman, president of the American Locomotive Company. About half will be Diesel and half steam. Not all of these will be for domestic use, as about 300 are already contracted for export.

★ Steam switch engines are still in the ring. C&O has just ordered 15 0-8-0's from Lima.

★ To Union Pacific goes the gratitude of Pullman passengers who are too often switched around in the middle of the night, interrupting sound sleep. UP has rearranged schedules of its transcontinental limiteds to allow switching of cars during daylight hours at Cheyenne instead of at night stops farther along.

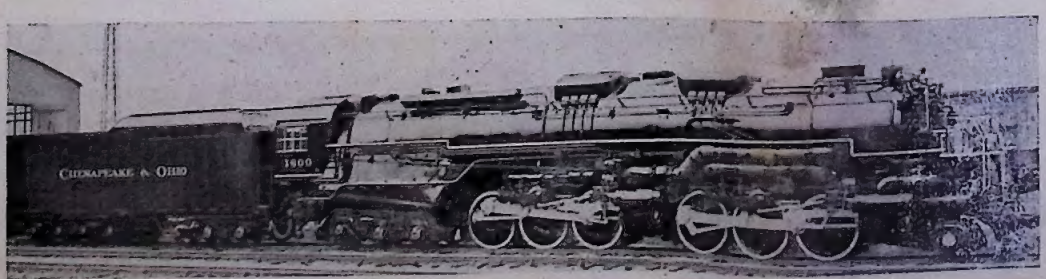
★ General Electric has a limited quantity of a quite elaborate and colorfully illustrated booklet describing Alco-G. E. Diesel-electric locomotives, and while they last will send a copy without charge to each TRAINS reader who writes General Electric, Dept. T-121, Schenectady, N. Y.

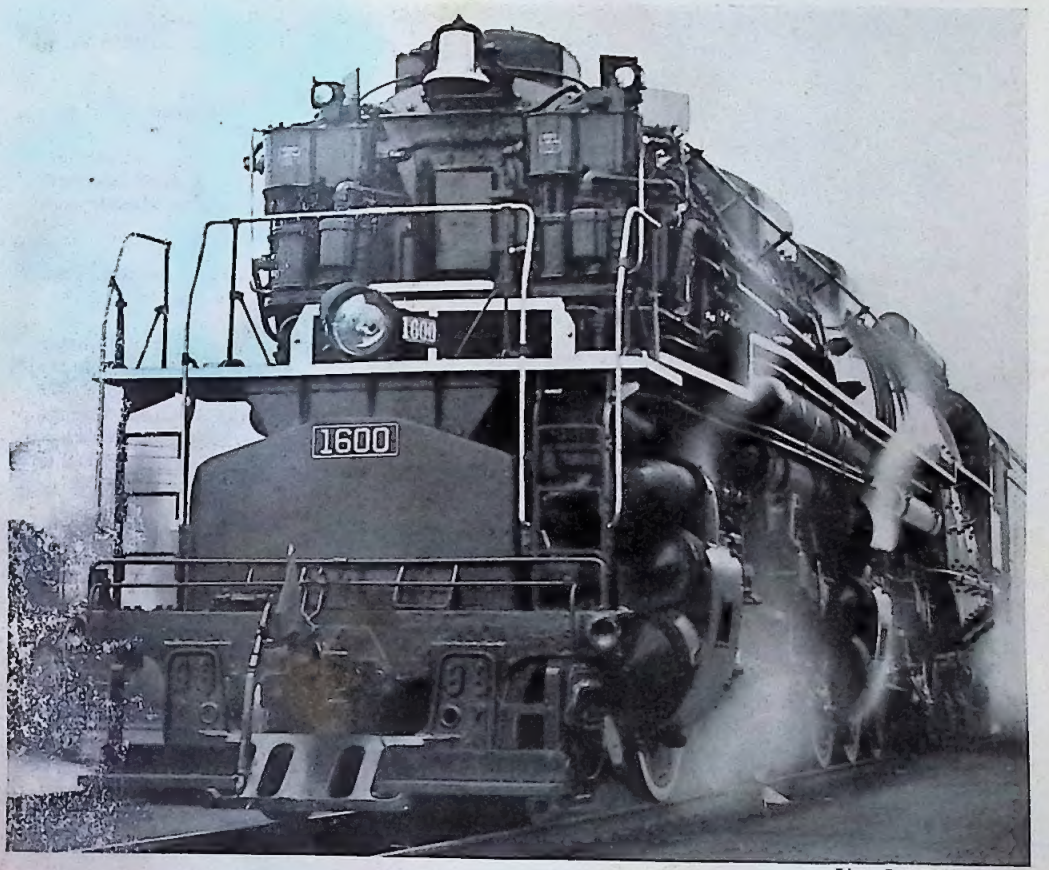
★ The Railroadians of America will hold their first annual photographic exhibit March 13, 7:30 p. m., at the Y. M. C. A., Pennsylvania Station, New York City, and will continue it to the end of the month at the Camera Club of New York, 121 W. 68th Street. Only photos by members will be eligible for display. Chairman of the exhibit is A. Sheldon Pennoyer, 114 E. 66th Street.

★ A handy train speed card for timing trains by the milepost-second hand method will be sent free on request sent with stamped, self-addressed envelope to Thomas B. Annin, secretary of the Railroadians, 43 Fairwood Road, Madison, N. J. The Railroadians are a non-profit association of those whose avocation is railroading. Besides the membership itself, members during 1941 received three fairly sizable railroad books. Annual dues are $4.

New C&O locomotive.

Here's the side-elevation photo of the new C&O 2-6-6-6 articulated class of locomotive. Another photo and technical information are on the opposite page.





Lima Locomotive Works.

The C&O's new Allegheny type of locomotive.

A new type of locomotive has been created, and that doesn't happen very often. This is not just a new design, but a new basic classification, as Whyte classified engines according to wheel arrangement. It is the new 2-6-6-6 articulated, with a two-wheel pony or leading truck, two six-wheel driving units, and a six-wheel trailing truck. Chesapeake & Ohio, proud parent, has christened it the Allegheny type. The 10 engines of the new 1600 series were built by Lima and have been assigned to service in the heavy coal traffic over the Allegheny Divide between Clifton Forge, Va., and Hinton, W. Va. So successful have the first 10 proved in the few short weeks they've been in use that another 10 have been ordered. The four cylinders are 22½" bore by 33" stroke, boiler pressure is 260 pounds, over all length is 113 feet, maximum starting tractive effort is 110,200 pounds, and weight of engine and tender in working order is 1,152,000 pounds. Sustained working speed can be as high as 70 miles an hour. For all this locomotive C&O paid approximately $250,000 per unit.

Trains

John B. Reschke, 690 8th Ave., New York City. See page 14.